

THE ADMISSIBILITY AND EVALUATION OF SCIENTIFIC EVIDENCE IN COURT

by

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I declare that 'THE ADMISSIBILITY AND EVALUATION OF SCIENTIFIC EVIDENCE IN COURT' is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

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## **SUMMARY**

Increasing use is being made of various types of scientific evidence in court. The general requirement for the admissibility of such evidence is relevance. Although expert evidence is considered to be opinion evidence, it is admissible if it can assist the court to decide a fact in issue; provided that it is also reliable. In South Africa, the initial wide judicial discretion to either admit or exclude unconstitutionally obtained evidence, has developed into a more narrowly defined discretion under the final Constitution. Examples of scientific evidence, namely, DNA evidence, fingerprints, psychiatric evidence, bite-mark evidence and polygraph evidence are considered and problems inherent in the presentation of such evidence in courts in various jurisdictions are highlighted. An investigation of the presentation and evaluation of evidence in both the accusatorial and inquisitorial systems seems to indicate that the adversarial procedure has a marked influence on the evaluation of evidence.

### **KEY TERMS:**

Scientific evidence; admissibility; expert witness; relevance; unconstitutionally obtained evidence; DNA profiling; fingerprint evidence; polygraph tests; psychiatric evidence; bite marks; accusatorial and inquisitorial systems of criminal procedure

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## CHAPTER ONE

### INTRODUCTION

A variety of scientific techniques are currently used for forensic purposes and new techniques and methods are constantly being added.<sup>1</sup> Forensic science includes such diverse fields as forensic medicine, toxicology, psychology, and anthropology as well as the work of specialised examiners of fingerprints, firearms, tool marks, and disputed documents.<sup>2</sup> Generally, the techniques employed by forensic scientists seem to stem from two principles:<sup>3</sup>

- (1) Locard's Principle: Every contact leaves a trace. Whenever any two objects come into contact with one another they effect each other in some way.<sup>4</sup>
- (2) Principle of Individuality: Two objects may be indistinguishable, but no two objects are identical.<sup>5</sup>

The combination of these two principles has enormous potential for the forensic scientist: if no two people are identical, then the impressions that people leave on objects with which they have been in contact will be different and can be used to identify them.<sup>6</sup>

There is a general perception that scientific evidence is in a class of its own, different in

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<sup>1</sup> The word 'forensic' means suitable for, or characteristic of a court of law. The term 'forensic science' is defined by the American Academy of Forensic Sciences as 'the study and practice of the application of science to the purposes of the law'. See PR De Forest, RE Gaensslen and HC Lee *Forensic Science: An Introduction to Criminalistics* (1983) 4

<sup>2</sup> J Nickell and JF Fischer *Crime Science: Methods of Forensic Detection* (1999) 1-2. These authors submit that the term 'forensic science' is broad enough to include even the social science of criminology. Another division of forensic science is so-called 'criminalistics' which is defined as 'a scientific discipline directed to the recognition, identification, individualisation and evaluation of physical evidence by application of the natural sciences to law-science matters'.

<sup>3</sup> B Robertson and GA Vignaux *Interpreting Evidence: Evaluating Science in the Courtroom* (1995) 3-4

<sup>4</sup> This principle was enunciated by Edmond Locard (1877-1966), a French forensic scientist and fingerprint expert.

<sup>5</sup> The question which arises in each case is whether the scientist has the ability to distinguish between two objects with the information provided or the tools available. Nickell and Fisher (at 2-3) draw the distinction between identifying an object (that is, saying something is a paint chip, or a shard of glass) and individualising an object (that is, demonstrating the uniqueness of an object, by, for example, saying it is a paint chip from a specific place). Criminalistics, according to these authors, is the science of individualisation.

<sup>6</sup> Robertson and Vignaux (at 4) submit that the second principle cuts the other way as well. If no two objects are identical, then no two fingerprint impressions will be identical even though they are taken from the same person. The question then arises how one determines that they actually came from the same source.

character from other evidence. According to Robertson and Vignaux<sup>7</sup> there are a number of reasons for this. One is the lawyer's expectation that scientific witnesses can give unequivocal answers: yes or no, identity or non-identity. Secondly, scientific evidence may be quantifiable and there seems to be a view that probability theory only applies to such evidence. Thirdly, scientific evidence is given by professional people about whom, in the public perception, the usual doubts about witnesses' credibility and truthfulness should not arise.

Popular fiction and television perpetuates the perception that science can give unambiguous answers to any forensic dilemma. The technique of DNA profiling, for example, has become part of the popular vernacular and is generally perceived to be infallible. However, any technique will only function to a high degree of precision under controlled conditions, and the conditions under which forensic scientists operate are far from controlled. Trace evidence left at a crime scene will often be contaminated or degraded. It follows that an expert witness will not be able to say that a sample definitely came from a specific person. Often the evidence will only allow the assessment of a probability that the two samples came from the same source.<sup>8</sup>

It is with the assessment of the value of scientific evidence that the legal system seems to have the greatest difficulty. Scientific evidence requires care in its interpretation, since the random variation naturally associated with scientific observations may cause problems.<sup>9</sup> The effect of this random variation must be assessed with the appropriate use of probabilistic and statistical reasoning.<sup>10</sup> Statisticians are familiar with variation, as are forensic scientists who observe it in the course of their work. Lawyers, however, prefer certainties: a defendant is found guilty or not guilty. The scientist's role in court is restricted to giving evidence as to whether or not two pieces of evidence (for example, marks or tissue samples) have the same origin or originated from two different sources.

The probative value of evidence is dependent on its ability to distinguish between hypothesis, thus, it is important for forensic scientists and legal practitioners to consider appropriate

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<sup>7</sup> Op cit at 69

<sup>8</sup> Robertson and Vignaux at 7

<sup>9</sup> See generally CGG Aitken *Statistics and the Evaluation of Evidence for Forensic Scientists* (1995) 4-5

<sup>10</sup> Aitken op cit (at 5) recognises the difference between statistics and probability. Probability is a deductive process which argues from the general to the particular. Statistics is an inductive process which argues from the particular to the general. Fundamental to both statistics and probability is uncertainty.

alternative hypotheses. Forensic scientists should give evidence in a way that clearly expresses the value of the evidence and enables the court to combine it with other evidence in the case.<sup>11</sup> The consequences of erroneous reasoning with regard to probabilities can be very serious.<sup>12</sup> Blind faith in scientific evidence in general, and in the results of DNA typing in particular, creates the potential danger that cases could be brought with little or no corroborating evidence.<sup>13</sup>

A problem often associated with expert witnesses, is that the court does not usually have independent means by which it can verify a particular witness' conclusions. Where rival experts' opinion diverge, as is often the case in an accusatorial system, the problem becomes compounded by the fact that the court, with no access to its own independent expert, would have to rely "upon doubtful factors such as the rival witnesses' reputations and experience".<sup>14</sup>

This study sets out, in Chapter Two, to familiarise the reader with the fundamental legal principles regarding the admissibility of evidence in court. The concept of relevance and its application to the question of admissibility of evidence in general and expert evidence in particular, is considered. The general legal principles pertaining to the admissibility of evidence are discussed in terms of South African law, as well as foreign law.<sup>15</sup> Firstly, consideration is given to the various qualities necessary to make someone an 'expert witness', after which various provisions of the Criminal Procedure Act<sup>16</sup> which deal with the reception of scientific expert evidence in South African criminal trials are considered. The probative value of such expert evidence is discussed in terms of South African case law. When dealing with the question of admissibility of expert evidence, reference is made to American law, the reason for this being two significant legal decisions in the United States, namely *Frye v United States*<sup>17</sup> and *Daubert v Merrell Dow Pharmaceuticals, Inc*<sup>18</sup> both which dealt with the admissibility of scientific evidence. Whereas South African law and English law apply general rules of

<sup>11</sup> Robertson and Vignaux at 219-220

<sup>12</sup> See generally DJ Balding and P Donnelly 'The Prosecutor's Fallacy and DNA Evidence' (1994) *Criminal Law Review* 711

<sup>13</sup> JA Goodwin and L Meintjies -Van der Walt 'The use of DNA Evidence in South Africa: Powerful Tool or Prone to Pitfalls?' (1997) 114(1) *South African Law Journal* 151 at 170-171

<sup>14</sup> See *S v Malindi* 1983 (4) SA 99 (T) at 104H-105A

<sup>15</sup> Keeping in mind that these legal rules generally apply in Anglo-American countries that follow the accusatorial system of criminal procedure.

<sup>16</sup> Act 51 of 1977

<sup>17</sup> 293 F 1013 (DC Circuit 1923)

admissibility (such as relevance) to scientific evidence, as far back as 1923 the court in *Frye* set standards for admissibility that apply specifically to scientific evidence. The survival of the rules as set out in *Frye* and the rejection of these by the Supreme Court of the United States in 1993 in the *Daubert* case is discussed, as well as the way in which courts in the United States have subsequently dealt with admissibility issues regarding scientific evidence. Following this, the admissibility of unconstitutionally obtained evidence in terms of South African law is investigated. The final Constitution<sup>19</sup> contains specific provisions regarding the admissibility of illegally obtained evidence,<sup>20</sup> whereas the interim Constitution<sup>21</sup> contained only a general right ensuring the right to a fair trial.<sup>22</sup> The development of the courts' approach to the issue of unconstitutionally obtained evidence, and specifically scientific evidence, is discussed with reference to South African case law.

In Chapter Three a few specific examples of scientific evidence presented to the courts are considered. DNA evidence is discussed, not only because of the relative novelty of the technique and the public perception of its infallibility; but also because of the many misconceptions about the probative value and the statistical interpretation of DNA evidence that seem to exist in the courts. Again, significant reference is made to foreign case law, since in the United Kingdom, Australia and the United States the technique has been available for longer than in South Africa.<sup>23</sup> More significantly, rapid technological advances in those countries, a greater number of cases which employ DNA evidence, privatisation of DNA testing facilities<sup>24</sup> and several legal challenges to the admissibility of DNA evidence, have led to a considerable body of foreign case law dealing with the subject. The techniques used for producing a DNA-fingerprint are briefly outlined, as well as challenges to various aspects of the methodology, after which the statistical interpretation of DNA evidence, and the various misconceptions which exist around the presentation of DNA evidence in court, are considered. Fingerprint evidence serves as an example of a technique which, though used in courts for a

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<sup>18</sup> 113 S Ct 2786 (1993)

<sup>19</sup> Constitution of the Republic of South Africa Act 108 of 1996

<sup>20</sup> Section 35(5) of the Constitution states that evidence obtained in a manner that violates the Bill of Rights must be excluded if the admission of that evidence would render the trial unfair or otherwise be detrimental to the administration of justice.

<sup>21</sup> Act 200 of 1993

<sup>22</sup> Section 25(3) of the 1993 Constitution

<sup>23</sup> The technique was first used in the United Kingdom and the United States in a criminal cases in 1987; in South Africa it was used for the first time in 1993 in a criminal trial.

<sup>24</sup> Such as Cellmark Diagnostics in the United States

long time<sup>25</sup> and often believed to be infallible in proving the presence of a person at a crime scene, is still subject to challenge in a court of law. These challenges are based on considerations regarding the number of points of similarity, the presence of dissimilarities and the manner of proving fingerprint comparisons. Polygraph testing<sup>26</sup> is discussed because of the significance of the case of *Frye v United States*<sup>27</sup> where the admissibility of polygraph evidence was considered and which led to the 'general acceptance' requirement for the admissibility of novel scientific evidence. In South Africa over the last few years, there has been an increase in the use of polygraph evidence in labour law and employment disputes. Bite mark evidence serves as an example of a technique which, though seldom used in court, has gained acceptance as a reliable scientific technique despite the lack of standardisation of procedures among forensic odontologists. Finally, some consideration is given to psychiatric evidence and the admissibility of such evidence is discussed in terms of South African case law and the provisions of the Criminal Procedure Act.<sup>28</sup> A novel psychiatric technique is discussed to show how scientific evidence is sometimes let in by the 'back door', often due to pressures on various parties involved in getting the new technology accepted in court.

In Chapter Four the general characteristics of the inquisitorial and accusatorial systems of criminal procedure are briefly outlined. This serves as an introduction to a consideration of the effect that certain procedures in the accusatorial system may have on the evaluation of scientific evidence in court. Specific reference is made to the calling of expert witnesses by the parties to a dispute and the 'battle of the experts' that often results because of this. The effect of cross-examination and the fact that the parties control the disclosure of relevant evidence in the adversarial trial is considered and solutions and recommendations are discussed.

Finally, in Chapter Five, some of the issues and problems surrounding the admissibility of scientific evidence as outlined in this study are summed up and some general solutions and guidelines for dealing with these problem areas are suggested.

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<sup>25</sup> See generally Nickell and Fischer at 112-116 for a history of the technique of fingerprinting. The first reports in the western world of ridges and pores in the hand and feet were by Dr Nehemiah Grew in 1684. Sir Francis Galton published a textbook on fingerprints in 1892 and by the early 1900's the technique of fingerprinting was in use by Scotland Yard and several prisons in the United States of America.

<sup>26</sup> Polygraph testing or polygraphy is also referred to as 'lie detection'.

<sup>27</sup> Supra note 17

<sup>28</sup> Act 51 of 1977

## CHAPTER TWO

### RELEVANCE, OPINION AND THE EXPERT WITNESS

#### 2.1 Relevance and opinion

The relevance of an item refers to its logical tendency to show the material fact for which the evidence is offered.<sup>29</sup> Section 210 of the Criminal Procedure Act 51 of 1977 states that no evidence as to any fact, matter or thing shall be admissible which is irrelevant or immaterial and which cannot conduce to prove or disprove any point or fact at issue in criminal proceedings. The rule is usually stated in its positive form by the courts, for example in *S v Gokool*<sup>30</sup> it was said that: "The law of evidence is foundationally based on the principle that evidence is admissible if it is relevant to an issue in the case." According to Schreiner JA in *R v Matthews & others*<sup>31</sup> relevance is based on a blend of logic and experience lying outside the law. Rule 401 of the Federal Rules of Evidence of the United States of America<sup>32</sup> defines relevant evidence as follows: "Evidence having the tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence."

Logical relevance is the *sine qua non* of admissibility; but it cannot guarantee that the evidence will be admitted. It seems that the ultimate fate of evidence, which can be seen to be logically relevant, depends on the nature and purpose of the trial.<sup>33</sup> Even if it is found that evidence is logically relevant, the question still remains whether it is sufficiently relevant to be admitted.<sup>34</sup> The law must draw a line between those facts, which it regards as sufficiently relevant to be admissible, and those which it considers too remote. In law, therefore, when evidence is said to be totally irrelevant, it means either that as a matter of common sense it is totally irrelevant, or that for the purpose of the trial it is not sufficiently relevant.<sup>35</sup>

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<sup>29</sup> E Du Toit, FJ de Jager, A Paizes, AStQ Skeen and S Van der Merwe *Commentary on the Criminal Procedure Act* (1997) 24-12

<sup>30</sup> 1965 (3) SA 461 (N) at 475G

<sup>31</sup> 1960 (1) SA 752 (A) at 758A

<sup>32</sup> As cited in PJ Schwikkard, AStQ Skeen and SE van der Merwe *Principles of Evidence* (1997) 43

<sup>33</sup> J McEwan *Evidence and the Adversarial Process* (1992) 31

<sup>34</sup> Du Toit *et al* at 24-12

<sup>35</sup> LH Hoffmann and D Zeffert *The South African Law of Evidence* (1988) 23

However, not all evidence found to be sufficiently relevant, is necessarily admissible, as there may be some other rule of evidence which excludes it.<sup>36</sup> Examples of relevant evidence that may be excluded are privileged communications and evidence obtained in breach of a constitutional right.<sup>37</sup> The various factors that may militate against receiving an item of evidence are conveniently set out in Rule 403 of the Federal Rules of Evidence<sup>38</sup> which provides as follows: "Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading to the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." In *R v Katz & another*<sup>39</sup> Watermeyer CJ stated that, facts, though relevant, which are excluded from proof, are usually those which are of little probative value and likely to cause prejudice.

An example of evidence that is usually excluded, is opinion evidence. Any opinion, whether expert or non-expert, which is expressed on an issue which the court can decide for itself without receiving such an opinion, is in principle inadmissible because it is irrelevant. In *Holtzhausen v Roodt*<sup>40</sup> it was held that the court has to determine whether the subject of the enquiry does raise issues calling for specialised skill and knowledge, since evidence of opinion on matters which do not call for expertise is excluded. The reason is that such opinion does not assist the court and is at best superfluous and, at worst, could cause confusion. This so-called opinion rule preserves or protects the fact-finding function of the court and is sometimes also expressed in terms of the 'ultimate issue' doctrine, namely that a witness may not express an opinion on an ultimate issue which the court must decide.<sup>41</sup> However, the ultimate issue doctrine fails to explain why courts at times permit not only experts, but also lay persons to express an opinion on the very issue the court has to decide. Wigmore<sup>42</sup> points out that the theory underlying the opinion rule is "simply that of the exclusion of supererogatory evidence."

<sup>36</sup> See *R v Schaube-Kuffler* 1969 (2) SA 40 (RA)

<sup>37</sup> See paragraph 2.5 *infra*

<sup>38</sup> As cited in *Du Toit et al* at 24-12. These authors submit that the same considerations apply in our law. In *S v Boesman* 1990 (2) SACR 389 (E) at 401b-c, it was held that the court has an overall discretion, based on public policy, to exclude evidence which would otherwise be admissible.

<sup>39</sup> 1946 AD 71 at 78

<sup>40</sup> 1997 (4) SA 766 (W) at 772C-D

<sup>41</sup> *Schwikkard et al* at 81. See also *Holtzhausen v Roodt* *supra* at 773C, where the court states that a "witness is not permitted to give an opinion on the legal or general merits of the case. The evidence of the opinion of the expert should not be proffered on the ultimate issue. The expert must not be asked or answer questions which the court has to decide."

<sup>42</sup> As cited in *Du Toit et al* at 24-15

Opinion evidence is in fact admissible if it is relevant, and an opinion will be relevant if the witness is better qualified to form the opinion than the court. Du Toit *et al*<sup>43</sup> stress that it is wrong to think of the reception of expert evidence as an exception to the opinion rule. The opinion of an expert, in the same way as that of a layman, is admissible if it is relevant. It is relevant if the expert by reason of his special knowledge or skill is better qualified to draw an inference than the judicial officer.<sup>44</sup> Du Toit *et al*<sup>45</sup> submits that it is therefore incorrect to draw a closed list of matters on which expert testimony may be adduced. Technical topics, for example, fingerprints, ballistics, DNA evidence and handwriting lend themselves more to elucidation at the hands of an expert, but the test is in each case whether the witness is in a position to add to the court's own observations. For example, a layman may identify someone's handwriting if he is familiar with it,<sup>46</sup> but only an expert may compare two unknown specimens of handwriting.<sup>47</sup>

## 2.2 The expert witness

In *R v Vilbro & another*<sup>48</sup> the opinion of a Chief Inspector of Indian and Coloured Education was received to assist the court on a question of racial classification. In *Hopes and Lavery v HM Advocate*<sup>49</sup> a typescript, by a typist, of an almost unintelligible tape recording was admitted to ascertain the contents of that recording. The criterion in these cases for admitting opinion evidence was that the witnesses, although not 'experts' in the usual sense, were in a better position than the court to draw the necessary inferences. In *S v Ramgobin & others*<sup>50</sup> it was held however, that repeated listening to a tape recording by a witness, did not make him an expert. The court accordingly excluded his opinion.<sup>51</sup>

The *Vilbro* approach indicates that the reception of expert evidence could be ascribed to the principle that opinion is admissible when it can assist the court. However, one should not be

<sup>43</sup> Op cit at 24-17

<sup>44</sup> Hoffmann and Zeffertt at 97

<sup>45</sup> Loc cit note 43

<sup>46</sup> *R v Malan* 1925 TPD 807 as cited in Du Toit *et al* at 24-17

<sup>47</sup> *Landsdowne NO v Wajar* 1973 (4) SA 329 (T) at 332

<sup>48</sup> 1957 (3) SA 223 (A)

<sup>49</sup> 1960 SC(J) 104 - cited in Du Toit *et al* at 24-27

<sup>50</sup> 1986 (4) SA 117 (N) at 163D-165C.

<sup>51</sup> The tapes were extremely inaudible, and the witness claimed they became intelligible after "weeks" of repeated listening.

misled by *Vilbro*, since there are instances where expert evidence (in the strict sense) is essential to give the court relevant information, and where the necessary qualifications of the expert have been narrowly defined. The courts have also determined areas where expert testimony is never admissible.<sup>52</sup> Hoffmann and Zeffertt<sup>53</sup> therefore concede that it might be theoretically sound to state, as do Du Toit *et al*<sup>54</sup> that there are no fixed classes of expert witnesses<sup>55</sup> however, they maintain that theory and practice do not coincide. They do so on the basis that since certain procedures apply to the calling of expert witnesses, one is forced to conceive of them as a specific category of witnesses. For example, in civil proceedings, a party who wishes to call an expert witness is required by the rules of court<sup>56</sup> to give his opponent notice of his intention to do so, and deliver to his opponent, a summary of the expert's opinion and reasons.<sup>57</sup> For the purpose of this rule, an expert is someone who gives an opinion either because he has special skill and knowledge on a topic where the court is quite unable of forming an opinion without assistance,<sup>58</sup> or where the help of an expert would be merely useful in a topic where the court "could come to some sort of independent conclusion."<sup>59</sup>

Expert opinion is readily received on issues relating to, for example, ballistics, engineering, chemistry, medicine, accounting and psychiatry.<sup>60</sup> This is not an exhaustive list, and there are cases where expert evidence – though not absolutely necessary – would nevertheless be of use.<sup>61</sup> Intoxication<sup>62</sup> and handwriting<sup>63</sup> are two examples. The case law also tends to distinguish what constitutes an 'expert' in certain instances. It is the function of the judge to decide whether the witness has sufficient qualifications to be able to give assistance.<sup>64</sup> In

<sup>52</sup> See Hoffmann and Zeffertt at 98

<sup>53</sup> Op cit at 99

<sup>54</sup> Op cit at 24-27.

<sup>55</sup> Du Toit *et al* are of the opinion that in a sense, every witness that is asked to express an opinion is an expert. and that it is strictly speaking not correct to speak of some witnesses as 'experts' and others as 'non-experts'.

<sup>56</sup> Supreme Court Rule 36(9) and Magistrate's Court Rule 24(9), which apply to civil cases.

<sup>57</sup> In criminal cases, prior disclosure may be demanded on constitutional grounds – see *Shabalala & others v Attorney-General of Transvaal & another* 1995 (2) SACR 761 (CC) paragraph [72]

<sup>58</sup> Hoffmann and Zeffertt at 100

<sup>59</sup> *Coopers (South Africa) (Pty) Ltd v Deutsche Gesellschaft fur Schadlingsbekampung MbK* 1976 (3) SA 35 (A) at 370 F-H

<sup>60</sup> See section 212(4) of the Criminal Procedure Act 51 of 1977, discussed *infra*.

<sup>61</sup> *Schwikkard et al* at 86

<sup>62</sup> See *S v Edley* 1970 (2) SA 223 (N) and *S v Skeal* 1990 (1) SACR 162 (Z)

<sup>63</sup> *R v Silverlock* 1894 (2) QB 766 (cited in *Schwikkard et al* at 85)

<sup>64</sup> Hoffmann and Zeffertt at 99-100. See also *Holtzhausen v Roodt* *supra* at 772H, where it was stated that it is for the judge to determine whether the witness has undergone a course of special study or has experience or skill that will render him or her an expert in a particular subject.

*Gentiruco AG v Firestone SA (Pty) Ltd*<sup>65</sup> the court stated that the true and practical test of the admissibility of the opinion of a skilled witness is whether or not the court can receive appreciable help from that witness on the particular issue. The court must be satisfied that the witness possesses sufficient skill, training or experience to assist it.<sup>66</sup> The expert's qualifications have to be measured against the evidence he has to give in order to determine whether he is sufficiently qualified to give relevant evidence.<sup>67</sup> For example, in *Mohamed v Shaik*<sup>68</sup> it was held that a general medical practitioner was not qualified to speak authoritatively on the significance of findings in a pathologists report concerning the fertility of semen. The party seeking to adduce the opinion of a witness as expert opinion must satisfy the court that the opinion is not supererogatory, that is, not irrelevant. For this purpose the court must be satisfied that:<sup>69</sup> (1) the witness not only has specialist knowledge, training, skill or experience but can furthermore, on account of these attributes or qualities, assist the court in deciding the issues;<sup>70</sup> (2) that the witness is indeed an expert for the purpose for which he is called upon to express an opinion;<sup>71</sup> and (3) that the witness does not or will not express an opinion on hypothetical facts that have no bearing on the case or which cannot be reconciled with all the other evidence in the case.<sup>72</sup> It is however not always necessary that the witness' skill or knowledge be acquired in the course of his profession, since the fundamental test is still whether the evidence can assist the court. In *R v Silverlock* (supra) for example, it was said that a solicitor who had made a study of handwriting could give expert evidence on the topic. The expert's experience and knowledge therefore, need not necessarily be acquired in the course of a profession, but may be the result of personal experience or even his own reading.<sup>73</sup> Where a witness refers to what has been written on a particular topic, this material only becomes evidence in so far as he has adopted it as his own testimony. The court may thus not make use of other portions of that material, which have not been referred to by the witness,

<sup>65</sup> 1972 (1) SA 589 (A) at 616H

<sup>66</sup> See *Menday v Protea Insurance Co Ltd* 1976 (1) SA 565 (E) at 579. See also the excerpt from *Holtzhausen v Roodt* supra at 772H

<sup>67</sup> See *S v Nangatuula* 1974 (2) SA 165 (SWA)

<sup>68</sup> 1978 (4) SA 523 (N)

<sup>69</sup> *Schwikkard et al* at 87

<sup>70</sup> *Ruto Flour Mills v Adelson (1)* 1958 (4) SA 235 (T) at 237C-D

<sup>71</sup> *Goliath v Fedgen Insurance Company Ltd* 1994 (2) PH F31 (E) at 83

<sup>72</sup> *S v Mkohle* 1990 (1) SACR 95 (A) at 100d

<sup>73</sup> See *Holtzhausen v Roodt* supra, where the court held (at 772H) that it is not necessary for the expertise to have been acquired professionally.

unless those portions have been put to him in cross examination.<sup>74</sup> In *S v Collop*<sup>75</sup> the court stated that although an expert may refer to textbooks to refresh his memory, or to correct or confirm his opinion, such books are not evidence *per se*. The expert who relies on information contained in a textbook, written by someone who is not called as a witness, does in fact make use of hearsay.<sup>76</sup> But in *Menday v Protea Assurance Co Ltd* (supra) it was held<sup>77</sup> that the expert witness is allowed to do so if certain conditions are met. Firstly, it must be shown that by reason of his own training he can affirm the correctness of the statements in the textbook; and secondly, that the work he refers to is reliable in the sense that it has been written by a person of established repute or proved experience in that field.

In criminal proceedings in South Africa, expert evidence is permissible on a large number of topics. Section 212(4)(a) of the Criminal Procedure Act<sup>78</sup> for example, refers to facts established by any examination or process requiring any skill in biology, chemistry, physics, astronomy, geography, anatomy, human behavioural sciences, any branch of pathology or toxicology, or the identification of finger-prints or palm-prints. This section provides for the reception of affidavits and certificates, related to such subjects, on their production as *prima facie* proof of their contents. Since these affidavits and certificates are hearsay because their probative value depends on the credibility of any person other than the testifying witness,<sup>79</sup> section 212 makes inroads into the domain of the hearsay rule.<sup>80</sup> Whenever any fact established by any examination or process requiring skill in one of the scientific fields listed in section 212(4)(a) is, or may become, relevant to an issue, that fact may be proved *prima facie* by an affidavit made by a person who alleges: (i) that he is in the service of the state, or a provincial administration, or that he is in the service of or attached to one of the bodies mentioned in this section;<sup>81</sup> and (ii) that he has established such fact by means of such an

<sup>74</sup> *S v De Leeuw* 1990 (2) SACR 165 (NC) at 174c-d. See also *R v Mofokeng & another* 1928 AD 132 (cited in Hoffmann and Zeffertt at 101)

<sup>75</sup> 1981 (1) SA 150 (A) at 167B-C

<sup>76</sup> Schwikkard *et al* at 92. See also note 79 *infra*

<sup>77</sup> At 569H

<sup>78</sup> Act 51 of 1977

<sup>79</sup> See section 3 of the Law of Evidence Amendment Act 45 of 1988

<sup>80</sup> The significance of section 212 in creating exceptions to the hearsay rule, however, has been reduced dramatically by the wide discretionary powers to receive hearsay evidence which our courts enjoy in terms of section 3(1) of Act 45 of 1988 (Du Toit *et al* at 24-26 )

<sup>81</sup> The maker of the affidavit or certificate must allege that he is either (i) in the service of the state or a provincial administration, or (ii) in the service of or attached to the South African Institute of Medical Research, a university in the Republic, or any other body designated by the Minister for the purposes of the subsection by notice in the *Government Gazette*.

examination process. A certificate may be issued in *lieu* of an affidavit in cases in which skill is required in chemistry, anatomy or pathology. A document tendered under this subsection must be in the form of an affidavit or a certificate and the facts sought to be established must require skill in one of the specified disciplines.<sup>82</sup> Furthermore, for such an affidavit or certificate to be admissible under subsection (4), it must contain all the necessary allegations. In *S v Rantsane*<sup>83</sup> an affidavit was held inadmissible since it contained no allegation that certain facts had been established by means of an examination or process requiring skill in one of the specified fields. In *S v Tshabalala*<sup>84</sup> the state produced an affidavit merely stating that a substance was analysed "by a process requiring skill in chemistry", without describing the nature of the process. Preferring the minority judgement of Du Plessis J in *S v Van der Sandt*,<sup>85</sup> the court held that more was required in an affidavit than mere duplication of the wording of section 212(4)(a): the deponent had to qualify himself, he had to identify the process utilised (by name or by giving a brief description), and he had to state that any instruments used by him had been properly calibrated.<sup>86</sup> In *S v Paulsen*<sup>87</sup> it was held that the person who signs the document must state therein, *inter alia*, not only that he is in service of the State, but also that he determined the relevant fact himself. The affidavit or certificate would otherwise have no evidentiary value and would constitute "double hearsay", and this could not have been the intention of the legislator. In *S v Loeve*<sup>88</sup> the court held that no evidence was necessary to determine the meaning of words such as 'grams' and 'millimetres' referred to in the certificate, since that would set section 212(4)(a) at naught and fly in the face of authority.

With regard to medical reports, the court held in *S v Nkhumeleni*<sup>89</sup> that it is inappropriate to make use of section 212(4) when handing in medico-legal reports as evidence, even when it is done with leave of the accused, since these reports contain, (in addition to pathological findings of trauma), various conclusions drawn by the district surgeon and opinions based on

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<sup>82</sup> Du Toit *et al* at 24-30

<sup>83</sup> 1979 (4) SA 864 (O)

<sup>84</sup> 1999 (1) SACR 412 (C)

<sup>85</sup> 1997 (2) SACR 116 (W). According to the majority judgement of Van Dijkhorst J in *Van der Sandt* it was necessary, before an affidavit in terms of section 212(4)(a) could constitute *prima facie* proof of the facts alleged, that the court be convinced, *ex facie* the affidavit, that the 'process' therein mentioned indeed required the required skill therein mentioned (at 133e).

<sup>86</sup> *S v Tshabalala* at 422c-f and 423e

<sup>87</sup> 1995 (1) SACR 518 (C) at 524i-j

<sup>88</sup> 1996 (1) SACR 560 (N)

<sup>89</sup> 1986 (3) SA 102 (V) at 107A-B

his observations.<sup>90</sup> Whether the fact in question has been established by a process that requires skill in one of the specified scientific fields, is for the court to determine in each particular case.<sup>91</sup> It was held in *S v Armstrong*<sup>92</sup> that only the court has the power to summon the deponent of an affidavit to give oral evidence; the defence may not object to the document being handed in, if the document complies with the formal provisions of section 212(4). In the *Armstrong* case, the ballistics expert had not given reasons in his affidavit for the conclusions arrived at based on his various observations. The court accordingly held that he should be summoned to give *viva voce* evidence, since “the court should no allow the eyes of the expert to become the eyes of the court”, and should be satisfied from its own observations that the conclusions were correct.<sup>93</sup>

The certificates and affidavits received under section 212 are given the status of *prima facie* proof, and in *S v Veldhuizen*<sup>94</sup> it was held that the words, as used in section 212, mean that the judicial officer will accept the evidence as *prima facie* proof of the issue. In the absence of any other credible evidence, the *prima facie* proof will become conclusive proof, and merely adducing evidence, in order to create doubt regarding the accuracy of the document, is not sufficient.<sup>95</sup> In the case of *S v Mkhize and others*<sup>96</sup> the court held that since the mere production of affidavits in terms of section 212(4) has such a significant legal effect, there is a duty on those who issue such affidavits to ensure that they are properly and accurately drafted.<sup>97</sup> The fact that the inadequately prepared affidavit in the *Mkhize* case was not contradicted by the defence did not, in the opinion of the court render the evidence more

<sup>90</sup> Van der Spuy AJ was of the opinion (at 107B) that resort should be had to section 220 of the Criminal Procedure Act, in terms of which the contents of the report should be put to the accused and he should be asked whether he admits the facts contained therein. If he does not admit one or more of the facts, then the district surgeon should testify upon them. Du Toit *et al* are of the opinion that the effect of section 220 is far more drastic than that of section 212(4), in that it provides for ‘sufficient proof’ as opposed to merely ‘*prima facie* proof’. The courts should thus be cautious in employing this ‘new procedure’ as espoused in *Nkhumeleni*, and the dangers relating to formal admissions should carefully be assessed and guarded against.

<sup>91</sup> Du Toit *et al* at 24-32. In *S v Greeff* 1995 (2) SACR 687 (A), for example, the Appellate Division held that the process for determining the accused’s blood alcohol content in that case, as reflected in a report by a chemist, was a ‘chemical process’ requiring skill in chemistry for the purpose of section 212(4)(a), in spite of the fact that a computer was relied on to facilitate the process.

<sup>92</sup> 1998 (1) SACR 698 (SE) at 701b

<sup>93</sup> At 703b

<sup>94</sup> 1982 (3) SA 413 (A)

<sup>95</sup> At 416G

<sup>96</sup> 1998 (2) SACR 478 (W)

<sup>97</sup> At 489j-490b. In this case the police ballistics expert had failed to properly record relevant data on the prescribed laboratory forms, had not taken photographs of the ammunition components under the comparison microscope, and in addition, due to the loss of certain specimens was later unable to furnish reasons for the

acceptable; uncontradicted evidence was not necessarily acceptable evidence. The court held that the onus remained at all times fixed on the state, to prove by way of acceptable evidence the facts they allege.<sup>98</sup> In *S v De Leeuw* (supra) it was held<sup>99</sup> that an extract from a textbook, which had not been incorporated in the testimony of a witness, nor put to an opposing witness in cross-examination, cannot be used to deprive a certificate of its status as *prima facie* evidence, since such an extract is not 'evidence'.

Section 212(8) of the Criminal Procedure Act deals with the receipt, custody, packing, marking, delivery or despatch of fingerprints, palm-prints, specimens, tissue, etc. An affidavit made by an appropriate person constitutes *prima facie* proof that he has performed the official duties alleged by him under section 212(8)(a)(ii). He must allege that he is in the service of the state, or in the service of or attached to the South African Institute for Medical Research, a university in the Republic, or any body designated by the Minister under section subsection (4). In *S v Du Plessis*<sup>100</sup> the court found that the affidavit of an analyst, regarding the percentage of alcohol in the accused's blood, rendered it unnecessary for the state to adduce evidence as to how the blood sample got from the police to the analyst. However, a certificate, which contained no reference to the custody of a blood sample between the time of its receipt and the time of its analysis – including information as to how it was kept and by whom – was held to be defective in *S v Van der Westhuizen*.<sup>101</sup> That case was subsequently overruled by *S v Boyce*.<sup>102</sup> The certificate in the *Boyce* case was held to have complied with the provisions of section 212(8): the gist of the certificate was that, when the analyst received the blood sample, it was sealed and bore the same seal number as that which had been placed on it by the doctor who drew the blood sample. In *S v Jantjies en 'n ander*<sup>103</sup> the Appellate Division endorsed the approach taken in *S v De Leeuw*<sup>104</sup> and supported the overruling of the *Van der Westhuizen* case by *Boyce*.<sup>105</sup> The court in *Jantjies* held that, where there was no indication of a significant lapse of time between the receipt of the sample and the analysis of the sample, it was not

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opinions he expressed in the affidavit.

<sup>98</sup> At 491c-d

<sup>99</sup> At 174b-d

<sup>100</sup> 1972 (4) SA 31 (A) at 34A-C

<sup>101</sup> 1989 (1) SA 468 (T) at 473E-F

<sup>102</sup> 1990 (1) SACR 13 (T)

<sup>103</sup> 1993 (2) SACR 475 (A)

<sup>104</sup> See *De Leeuw* (supra) at 172e-173g where the court held that it was not necessary to refer to the custody of a blood sample in a certificate in terms of section 212(8)(a).

<sup>105</sup> *Du Toit et al* at 24-32

necessary for the analyst to allege that the sample had been in his custody from the time of his receiving it, until the time of analysis.<sup>106</sup>

### 2.3 The probative value of expert evidence

Expert witnesses are in principle required to support their opinions with valid reasons, but no hard-and-fast rules can be laid down. Much will depend on the nature of the issue and the presence or absence of attack on the opinion of the expert.<sup>107</sup> In *S v Williams*<sup>108</sup> Aaron AJ remarked that the failure of an expert to furnish reasons for his opinion effected only the weight and not the admissibility of his evidence. The courts frequently receive the opinion of an expert that is not supported by reasons, but will rarely accept a bald statement of opinion on the very fact it has to decide.<sup>109</sup> It is conceivable that a failure to give reasons may so take away from the value of the evidence as to leave it without any weight. In that case it will have no probative value and is therefore irrelevant and inadmissible.<sup>110</sup> In *S v Ramgobin and others* (supra) Milne JP stated<sup>111</sup> that, where there is a serious challenge to the conclusions reached, the expert must be in a position to give detailed reasons for his conclusions, and an accurate account of the investigations that he carried out in order to arrive at his conclusions. He added that the 'evidence' is the oral evidence given by the expert, and any notes and reports that the expert refers to, are not evidence *per se*, but merely an *aide-memoire*. The court held in *S v Kotze*<sup>112</sup> that if proper reasons are advanced for an opinion, the probative value of such an

<sup>106</sup> In *S v Van der Westhuizen* there had been a significant lapse of time (27 days), while in *S v Jantjies*, there was not. The question of custody was thus held to be irrelevant in *Jantjies*, and the Appellate Division was of the opinion that, in so far as *Van der Westhuizen* laid down a general rule requiring that reference be made to the custody of the sample, it had been wrongly decided.

<sup>107</sup> Schwikkard *et al* at 88. See also *State v Ramgobin & others* (supra)

<sup>108</sup> 1985 (1) SA 750 (C) at 753G

<sup>109</sup> See Du Toit *et al* at 24-28. For example, in *S v Gouws* 1967 (4) SA 527 (E) an appeal was allowed because the magistrate accepted the opinion of a chemist that the drug Drinamyl was classified as a potentially harmful drug, without being given an explanation how the drug's chemical composition brought it within the relevant statutory category.

<sup>110</sup> For example, in *S v Mokgiba* 1999 (1) SACR 534 (O) the court rejected the evidence of a pathologist, who without stating the grounds therefore, expressed an opinion that a firearm had been thrust into the deceased's mouth before the fatal shot was fired. The court held (at 547a -548e) that the expert has to state the grounds upon which his opinion is based and that bald statements of an expert's opinion has no value. See also *S v Mkhize and others* 1999 (1) SACR 256 (W) where the court held that in the absence of reasons for opinions by expert witness, as well as the lack of photographs with regard to ballistics evidence, it could not rely on the evidence.

<sup>111</sup> At 146D-G

<sup>112</sup> 1994 (2) SACR 214 (O) at 225i

opinion will of necessity be strengthened. However, in *S v Nyathe*<sup>113</sup> it was held that opinion evidence could, depending on the circumstances, be both admissible and sufficient without an exposition on the grounds upon which a particular opinion is based. Where an affidavit is used to establish the opinion of a fingerprint expert – as per section 212(4) of the Criminal Procedure Act - it was held in *S v Ndhlovu*<sup>114</sup> to be “highly desirable” that it should disclose the nature of the similarities upon which the opinion is founded, “at least to the extent that it is the normal practice for such to be done when the fingerprint expert is giving evidence *viva voce*”.

When an expert draws an inference from facts furnished by other witnesses, as opposed to facts within his personal knowledge, his opinion carries no probative force unless the facts on which his opinion is based are proved.<sup>115</sup> No reliance can be placed on the evidence of the expert witness if, for example, counsel puts his own interpretation of the evidence to the expert, and then asks for an opinion from the expert.<sup>116</sup> In *S v Van As*<sup>117</sup>, Kirk-Cohen J distinguished between two situations: the first is where the expert’s opinion is based on that of recognised writers or authority in the science concerned; the second is where the expert has personally conducted experiments and then in court bases his opinion on the results of his experiments. The court held that in the latter case it is easier for the court to follow and understand the evidence, to accept it and to rely on it in deciding the issue.

Difficulties may arise in assessing the probative value of expert evidence, since there might be a conflict of expert testimony in a given case and, in addition, the general repute of the witnesses’ profession may play a role in the assessment of such evidence. For example, evidence of fingerprint experts is generally readily accepted, but the opinion of experts as to the identity of handwriting is not as highly regarded, and the court will not act upon such evidence unless it can see the alleged resemblances for itself.<sup>118</sup> In *S v M*<sup>119</sup> the court held that it is not bound by expert evidence, however, the “wise judicial officer does not lightly reject expert evidence on matters falling within the purview of the expert witness’s field”. In *S v*

<sup>113</sup> 1988 (2) SA 211 (O) at 2151-J

<sup>114</sup> 1965 (3) SA 390 (N) at 392G-H

<sup>115</sup> Du Toit *et al* at 24-29

<sup>116</sup> *S v Zwane & others* (3) 1989 (3) SA 253 (W) at 278G-H

<sup>117</sup> 1991 (2) SACR 74 (W) at 86i

<sup>118</sup> Hoffmann and Zeffertt at 103-104. See also *S v Van Dyk* 1998 (2) SACR 363 (W) where the court stated (at 375h -i) that the evidence of a handwriting expert should be approached with caution.

<sup>119</sup> 1991 (1) SACR 91 (T) at 99j - 100c

*Venter*<sup>120</sup> Nestadt JA approved of the trial court's rejection of expert testimony. In this case, the Appellate Court confirmed that it will not lightly depart from the uncontroverted views of an impartial, well-qualified and experienced expert, however, the court felt persuaded that the reasons given by the trial court for rejecting the expert's evidence were warranted.<sup>121</sup> In *Motor Vehicle Insurance Fund v Kenny*<sup>122</sup> it was held that direct and credible evidence of what happened in a collision, is generally of greater weight than the opinion of an expert, however experienced he may be, of what probably occurred. The court held in *Abdo NO v Senator Insurance Co Ltd and another*<sup>123</sup> that in civil cases where there are mutually destructive accounts about how a motor accident happened, the court must first consider direct evidence. If that is unacceptable, the court must decide which opinion is preferable and base its decision on it. Where one version is more probable than the other is, the court should make a provisional finding regarding its acceptability and then consider whether the expert evidence affects the provisional conclusion, bearing in mind on whom the onus of proof rests.

The opinion of an expert must be ignored, and thus be held inadmissible, if it is based on some hypothetical situation which has no relation to the facts in issue or which is entirely inconsistent with the facts found proved.<sup>124</sup> This is often a problem found with psychiatric evidence, where a psychiatrist relies solely on the accused's version of events in assessing his or her mental condition for purposes of determining criminal responsibility.<sup>125</sup> It is also important that an expert witness should remain objective despite the fact that he is, in terms of our adversarial system, called by a party to testify in support of the latter's case.<sup>126</sup> In *S v Kotze* (supra) Lombard J relied heavily on the opinions of experts, not only because they had advanced reasons in support of their conclusions, but also because their opinions had the mark of objective professionalism.<sup>127</sup>

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<sup>120</sup> 1996 (1) SACR 664 (A)

<sup>121</sup> At 666f-j

<sup>122</sup> 1984 (4) SA 432 (E). The opinion of the court in *Kenny* was confirmed in *Van Eck v Santam Insurance Co Ltd* 1996 (4) SA 1226 (C) at 1229H-I, where the court held that since expert testimony on the cause of a motor vehicle accident is invariably based on reconstruction, it cannot conceivably bear the same weight as direct, eye-witness testimony of the event in question.

<sup>123</sup> 1983 (4) SA 721 (E)

<sup>124</sup> *S v Mkhohle* 1990 (1) SACR 95 (A) at 100c-d. See also *S v Boyce* (supra) at 18g-19d

<sup>125</sup> *S v Loubser* 1979 (3) SA 47 (A) at 57F-G and 60B-C

<sup>126</sup> *Stock v Stock* 1981 (3) SA 1280 (A) at 1296E

<sup>127</sup> At 225j

## 2.4 Admissibility of expert scientific evidence

In the United States, rules pertaining to the admissibility of scientific evidence were originally set in *Frye v United States*.<sup>128</sup> The court established that for a scientific procedure to be admissible as evidence in a court of law, the procedure must be generally accepted in the relevant scientific community. The court stated in *Frye*:<sup>129</sup> “Just when a scientific principle or discovery crosses the line between the experimental and the demonstrable stages is difficult to define. Somewhere in this twilight zone, the evidential force of the principle must be recognised, and while the courts will go a long way in admitting expert testimony deduced from a well recognised scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.” This became known as the so-called ‘*Frye* rule’ (or ‘general acceptance’ rule) which, until recently<sup>130</sup> remained the most acceptable standard for determining the admissibility of scientific evidence.<sup>131</sup> Rationales that courts have offered for the *Frye* rule, include the following: it tends to ensure the reliability of scientific evidence; it guarantees that there will be experts that can review the validity of a scientific determination in a particular case and thus promotes uniformity of decisions among different courts; and it avoids a protracted determination of the reliability of a scientific technique in a particular case.<sup>132</sup>

The *Frye* test, however, has come under serious criticism.<sup>133</sup> There is reason to believe that it precludes the admission of reliable evidence, in that valid scientific knowledge may be excluded from evidence if it is too recent or too limited in application to have reached the level of general acceptance.<sup>134</sup> There may be difficulties in identifying the scientific field into which the principle or technique falls and in determining whether the technique or principle has become

<sup>128</sup> 293 F 1013 (DC Circuit 1923)

<sup>129</sup> At 1014

<sup>130</sup> In 1993, the United States Supreme Court, in the case of *Daubert v Merrell Dow Pharmaceuticals* (see *infra*) set new standards for the admission of scientific evidence.

<sup>131</sup> JA Gold, MJ Zaremski, ER Lev and DH Shefrin ‘*Daubert v Merrell Dow: The Supreme Court tackles Scientific Evidence in the Courtroom*’ (1993) 270(24) *Journal of the American Medical Association* 2964 at 2965

<sup>132</sup> See *United States v Addison* 498 F2d 1013 (DC Cir 1974); *Reed v State* 283 Md 374, 391 A2d 364 (1978); *People v Kelly* 17 Cal3d 24, 549P2d 1240, 130 Cal Rptr 144 (1976) cited in Gold *et al* at 2965

<sup>133</sup> See generally M Bennett ‘Admissibility issues of Forensic DNA Evidence’ (1995) 44 *University of Kansas Law Review* 141 at 160-164

<sup>134</sup> Gold *et al* at 2965 citing *United States v Sample* 378 F Supp 44 (ED Pa 1974)

generally accepted in that particular field.<sup>135</sup> Many techniques employ several different fields of science. If a court only considers the degree of acceptance in one field, that determination will be incomplete.<sup>136</sup> The court in *United States v Williams*<sup>137</sup> openly denounced *Frye*, noting that the results under the *Frye* test can be influenced by different selections of the 'relevant scientific community'. Another criticism of the court in *Williams* was that, by deferring to acceptance by experts, it entrusts the issue of validity to scientists rather than to the courts.<sup>138</sup> The argument most often cited against the *Frye* test is that the requirement of general acceptance makes the test too conservative and therefore excludes too much relevant evidence from the courtroom.<sup>139</sup> This argument assumes that a significant amount of evidence is reliable and relevant even though the technique used is novel and may not yet be generally accepted in the scientific field.<sup>140</sup> On the other hand, some commentators argue that the general acceptance test may let evidence that is not reliable into the courtroom.<sup>141</sup> This argument rests on so-called 'false general acceptance' or general acceptance of a scientific technique that later turns out to be unreliable.<sup>142</sup> *United States v Williams* (supra) and *United States v Downing* (supra), both provided an alternative test for admissibility of scientific evidence – the so-called relevancy standard.<sup>143</sup> The court in *Williams* envisioned a test for admissibility of scientific evidence that considered many factors other than peer review. These factors included: the potential rate of error, the existence and maintenance of standards, the manner in which the technique is employed, whether other analogous techniques are routinely admitted and, whether the test contains "fail safe" characteristics. The court suggested that these indicators of reliability, as opposed to a simple head-count of experts who believe the theory is reliable, are more proper for the trial judge to use in determining admissibility issues.<sup>144</sup> The court in

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<sup>135</sup> P Giannelli 'The admissibility of novel scientific evidence: *Frye v United States*, a half-century later' (1980) 80 *Columbia Law Review* 1201 at 1208-1209

<sup>136</sup> Bennett at 161

<sup>137</sup> 583 F2d 1194(2<sup>nd</sup> Cir 1978), cert. denied 439 US 1117 (1979) cited in Bennett at 163

<sup>138</sup> See Gold *et al* at 2965. Injustices will be perpetuated if the evidentiary standard is either too low or too high. Courts in the United States that use the *Frye* rule have been criticised for their excessive caution in allowing juries to hear and evaluate scientific evidence and giving such scientific test results less probative weight than they warrant.

<sup>139</sup> Bennett at 160 citing *United States v Downing* 753 F2d 1224, 1237 (3<sup>rd</sup> Cir 1985)

<sup>140</sup> Giannelli at 1223

<sup>141</sup> See Giannelli at 1224-1225

<sup>142</sup> Bennett at 161. The author uses the example of the "paraffin test", once used to determine the existence of gunpowder residue on a suspect's hands. The test was developed in 1933, first admitted in court in 1936 and used until the 1960's. It was not until the late 1960's that further research was published, indicating the test was not reliable.

<sup>143</sup> Bennett at 163

<sup>144</sup> *Ibid*.

*Downing* found the terms ‘scientific community’ and ‘general acceptance’ too vague to be consistently defined, thereby precluding a consistent application of the *Frye* test. To replace the *Frye* test, the court established a more flexible approach to admissibility based on the reliability of the proposed scientific testimony. The reliability test set forth in *Downing*, similar to the multifactor test in *Williams*, proposed examining several factors other than peer review. These factors included: the relationship to other established methods of scientific analysis, specialised literature on the proposed method, circumstantial evidence such as the credentials of the expert and non-judicial uses of the method, the rate of error and the type of errors commonly generated.<sup>145</sup>

In 1974, the United States Congress adopted the Federal Rules of Evidence, which determine evidentiary matters in the federal courts.<sup>146</sup> Rule 702 provides as follows: “If scientific, technical or other specialised knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training or education, may testify thereto in the form of an opinion or otherwise.” This rule should be read with Rule 401, which requires that in addition, evidence should be relevant.<sup>147</sup>

In 1993, in *Daubert v Merrell Dow Pharmaceuticals, Inc.*<sup>148</sup> the Supreme Court of the United States held that general acceptance within the scientific community alone is not an adequate gauge by which to measure whether or not a particular scientific technique should be admitted.<sup>149</sup> The court held further that the correct admissibility standard was Federal Rule 702. The legal question in the *Daubert* case was whether Federal Rule 702 may be read to incorporate the *Frye* rule, or whether Rule 702 was meant to supersede the *Frye* rule and substitute a more liberal standard as to precisely what knowledge will assist a jury. The Supreme Court in *Daubert* overturned the previous judgement of the Court of Appeals<sup>150</sup> and held that the *Frye* test is indeed overruled by the Federal rules of Evidence, which do not refer to a general acceptance standard. The *Frye* general acceptance test is thus no longer to be

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<sup>145</sup> Bennett at 164

<sup>146</sup> Gold *et al* at 2965

<sup>147</sup> See paragraph 2.1 *supra*

<sup>148</sup> 113 S Ct 2786 (1993)

<sup>149</sup> JA Goodwin and L Meintjies-Van der Walt ‘The use of DNA evidence in South Africa: Powerful Tool or Prone to Pitfalls?’ (1997) 114 (1) *South African Law Journal* 151 at 167

<sup>150</sup> *Daubert v Merrell Dow Pharmaceuticals, Inc.* 951 F2d 1128 (9<sup>th</sup> Cir 1991)

applied in federal courts.<sup>151</sup> The Supreme Court remanded the case back to the appeals court with the order to reconsider the case while directly applying the criteria of Rule 702. The Supreme Court went on to interpret Rule 702 as a guide for judges in deciding whether to admit expert testimony. As to the meaning of 'scientific...knowledge' in Rule 702, Justice Blackmun, in his majority opinion, interpreted 'scientific' to mean that the testimony be derived from the scientific method, and 'knowledge' to mean that the proposed testimony must be supported by appropriate validation. The scientific knowledge requirement thus establishes a standard of trustworthiness, in that the expert's opinion must have a reliable basis in the knowledge and experience of his discipline.<sup>152</sup> The test that the Court established from Rule 702 requires a judge to determine whether an expert proposes to testify to (1) scientific knowledge, that (2) will assist the trier of fact to determine or understand a fact in issue. Thus, the evidence must be both reliable and relevant – that is, have a valid scientific connection to the pertinent enquiry.<sup>153</sup> The court held that Rule 702 conferred on a trial judge a gate-keeping role, in that the judge must ensure that any and all scientific evidence is not only relevant, but also reliable.<sup>154</sup> The judge must undertake a preliminary assessment of both the scientific validity and the relevance of the proposed expert testimony, and admit only such testimony as meet the appropriate standards.<sup>155</sup>

The court in *Daubert*<sup>156</sup> outlined a number of criteria<sup>157</sup> to aid judges in their evaluation of expert scientific testimony: (a) whether the theory or technique can be (and has been) tested; (b) whether the theory or technique has been subjected to peer review and publication; (c) in the case of a particular scientific technique, what is the known or potential rate of error (d) the

<sup>151</sup> WM Sneed 'The ongoing revolution in expert witness practice: *Daubert* and the Seventh Circuit' (1998) 86 *Illinois Bar Journal* 418 at 419

<sup>152</sup> See Gold *et al* at 2965-2966

<sup>153</sup> Bennett at 166; Gold *et al* at 2966

<sup>154</sup> In the U.S.A. such gate-keeping takes place before the actual trial, activated by motions from the respective parties' lawyers to either offer or suppress evidence. In a jury trial, the judge decides questions of law, and the jury decides questions of fact (in contrast to a non-jury trial, in which the judge decides both types of questions). The judge, in responding to preliminary motions, can decide to keep from the jury two major types of evidence: either evidence that relates primarily to a legal question properly decided only by the judge, or evidence that is likely to prejudice or mislead the jury in deciding the facts. Cases are frequently dropped, settled, dismissed, or decided upfront by a verdict from the judge through the mechanism known as "summary judgement", simply on the basis of the preliminary skirmishing – see SJ Brakel, ER Gonzalez and JL Cavanaugh, Jr. 'Neuropsychiatry at the Courtroom Gates: Selective Entry or Anything Goes?' (1996) 1(3) *Seminars in Clinical Neuropsychiatry* 215 at 216

<sup>155</sup> Gold *et al* at 2966

<sup>156</sup> *Daubert v Merrell Dow Pharmaceuticals* (1993)

<sup>157</sup> At 2796-2797

existence and maintenance of standards controlling the technique's operations, and (e) to what extent is the theory or technique accepted within the relevant scientific community. None of these considerations is either necessary or sufficient to determine admissibility, nor is the list deemed to be exhaustive. Rather, these factors are to be part of a flexible enquiry into the scientific validity of the principles and methodology that underlie the proposed expert testimony.<sup>158</sup>

In *United States v Martinez*<sup>159</sup> the court found that the inquiry raised in *Daubert* requires a preliminary hearing to determine whether the expert applied a reliable technique in a particular case and in addition, whether the expert properly performed the scientific procedures. This suggests that the enquiry goes beyond merely an investigation into the reliability of abstract principles or methodologies. This enquiry, according to the court, is a flexible one and not every error in the application of a particular methodology should warrant exclusion.<sup>160</sup> The *Daubert* decision, therefore, has the effect that if the proponent of scientific evidence cannot convince the court of the reliability of the evidence, it will not be admitted. In practice, this would mean that the prosecution is obliged to adduce evidence in support of the reliability of the technique. This includes ensuring that the appropriate protocols and controls are implemented.<sup>161</sup>

The significance of the *Daubert* decision lies in the endorsement of the principle that there is a difference between science and pseudo-science, and that it is the judge's role to ensure that testimony offered as 'scientific' meet a minimum test of validity before it may be put before the court. The Supreme Court of the United States, by means of the *Daubert* decision, has thus staked out a middle ground between the *Frye* rule and the relevance approach: those courts that have been most permissive in admitting scientific evidence are likely to become more

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<sup>158</sup> *Gold et al* at 2966. To assuage the concern that failure to accept the general acceptance standard will result in verdicts based on "pseudoscientific assertions" Justice Blackmun stated that where testimony is admitted into evidence, it might still be attacked by vigorous examination, presentation of contrary evidence, and careful instruction on the burden of proof. As for the concern that the recognition of a gate-keeping role for the judge will stifle the search for truth, the court stated that scientific conclusions are subject to perpetual revision, while the law must resolve disputes finally and quickly. Science proceeds from a broad range of hypotheses, and those which are incorrect will eventually be shown up. Inevitably, the gate-keeping role of the judge, no matter how flexible, will prevent the jury from learning of authentic insights and innovations. That is nevertheless the balance that needs to be struck for the particularised resolution of legal disputes.

<sup>159</sup> 3 F3d 1191 (8<sup>th</sup> Circuit 1993) at 1197-8 (cited in Goodwin and Meintjies-Van der Walt at 168)

<sup>160</sup> *United States v Martinez* at 1198

<sup>161</sup> Goodwin and Meintjies-Van der Walt at 168

restrictive, occasionally not permitting testimony. At the same time, courts that previously have followed *Frye* are likely to admit at least some testimony that has not reached the level of general acceptance.<sup>162</sup>

In his dissenting opinion in *Daubert*,<sup>163</sup> Chief Justice Rehnquist agreed with the majority view that *Frye* did not survive passage of the Federal Rules of Evidence, as well as accepting that judges have some gate-keeping role to play. He warned however, that the so-called 'general observations' made in the remainder of the majority opinion might have the consequence of transforming federal judges into amateur scientists in order to carry out their gate-keeping responsibilities. In practice, *Daubert* has prompted a very active scrutiny of proffered experts by the federal bench.<sup>164</sup> In *Dukes v Illinois Central Railroad Co.*<sup>165</sup> the defendant challenged the admissibility of an expert's opinion, arguing that his conclusions were not reached through a scientific method. The court agreed, relying on the four factors discussed in *Daubert*, and placing particular emphasis on the first factor, that is, whether the proffered theory has been tested. The expert in that case had performed no independent studies and had reviewed no research for purposes of reaching his conclusions. The court in *Dukes* concluded that such subjective observation was insufficient to sustain an expert opinion on the cause of a medical condition. The expert must have objective support for his opinion, such as empirical data from his own tests or the research of other. Finding that the plaintiff's expert had not tested his theories; the *Dukes* court barred his testimony. Yet, even when experts claim objective support for their opinions, they can still be vulnerable to the *Daubert* challenge. In *Muzzey v Kerr-McGee Chem. Corp.*<sup>166</sup> the court asserted that the Supreme Court's list of factors as stated in *Daubert* was non-exhaustive and proceeded to add two more: (1) whether the expert is proposing to testify about matters growing naturally and directly out of research he has conducted independent of the litigation, or whether he has developed his opinions expressly for the purposes of testifying; and (2) whether the expert formed his opinion and then only looked

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<sup>162</sup> Gold *et al* at 2966

<sup>163</sup> *Daubert v Merrell Dow Pharmaceuticals* (1993)

<sup>164</sup> See Sneed at 420. For example, in *Wilson v City of Chicago* 6 F3d 1233, 1238 (7<sup>th</sup> Cir 1993) the court stated that the elimination of formal barriers to expert testimony has shifted to the trial judge the responsibility for keeping "junk science" out of the courtroom. Thus, judges and lawyers now think about the validity of proffered expert testimony in a different way than they did before *Daubert*. What might have qualified in the past as a challenge to the weight of expert testimony, may now serve to bar the expert from testifying.

<sup>165</sup> 934 F Supp 939 (ND Ill 1996) cited in Sneed at 420

<sup>166</sup> 921 F Supp 511 (ND Ill 1996) at 518 as cited in Sneed at 421

for reasons to support it, rather than doing research that lead to his conclusion.<sup>167</sup> In *General Electric Co. v Joiner*<sup>168</sup> the Supreme Court went on to reinforce the *Daubert* principle that federal trial judges must exercise a gate-keeping role in screening expert evidence.<sup>169</sup> The Supreme Court reviewed the underlying studies on which the plaintiff's experts had relied and approved the district court's conclusion that the studies were so dissimilar to the facts presented in the litigation that they did not support the expert opinion at issue. The court admitted that trained experts commonly extrapolate from existing data. They held, however, that nothing in *Daubert* or the Federal Rules of Evidence requires a court to admit evidence, which is connected to the existing data only by the *ipse dixit* of the expert. A court may thus conclude that there is simply too much of an "analytical gap" between the data and the opinion proffered.<sup>170</sup> The Supreme Court's decision in *Joiner* reinforces the gate-keeping role of federal trial judges, explicitly directing them to review the assumptions, factual support, supporting data and conclusions proffered in separating unacceptable speculation from admissible expert testimony.<sup>171</sup>

It is interesting to note that as early as 1987 in the case of *United States v Gipson*<sup>172</sup> the United States Court of Military Appeals held that military courts were no longer bound by the *Frye* standard for admitting evidence. The court stated that the various provisions of the Military Rules of Evidence form sufficient guidelines to admit expert testimony on scientific evidence.<sup>173</sup>

One virtue of the *Frye* test was its relative ease of administration. The judge was not required to examine the content or substance of the evidence, but only to determine objectively, if perhaps superficially, whether the technology has gained 'general acceptance' by the relevant scientific community. Due to the *Daubert* decision, judges in the federal courts in the United

<sup>167</sup> The court placed significant weight on this first-mentioned new factor and found that none of the three experts called by the plaintiff had done any research outside of the lawsuit. All three experts were thus barred. The *Muzzey* court's reliance on this factor shows how a legitimate challenge to the weight to be given to expert opinion can become a basis for excluding the testimony.

<sup>168</sup> 118 S Ct 512 (1997) discussed in Sneed at 421-422

<sup>169</sup> In so doing they reversed the eleventh circuit's decision in *Joiner v General Electric Co.* 78 F3d 524 (11<sup>th</sup> Cir 1996) which allowed expert testimony that had previously been excluded by the district court. The Supreme Court held that the district court's decision to disallow the plaintiff's expert testimony was not an abuse of discretion (as was stated by the eleventh circuit court).

<sup>170</sup> *Joiner* (1997) at 519

<sup>171</sup> See *Target Market Publishing, Inc. v Advo, Inc.* 136 F3d 1139 (7<sup>th</sup> Cir 1998) cited in Sneed at 423

<sup>172</sup> 41 Crim. L. Rep. (BNA) 2361 (C.M.A. July 13 1987)

<sup>173</sup> See the discussion in paragraph 3.3 *infra* on the admissibility of polygraph evidence and the subsequent enactment of Rule 707 of the Military Rules of Evidence

States will now have to delve into the issue of whether the evidence at issue is scientifically reliable; their gate-keeping function will thus be much more difficult and cumbersome than in the past. Brakel *et al*<sup>174</sup> point out the existence of a generally little noticed quirk in the law of (scientific) expert testimony that conceivably topples any barriers erected by *Daubert* or *Frye*. This quirk allows some types of evidence to “avoid the assiduously guarded front gate of the courtroom and slip in through a yawning aperture in the back.” They claim that the alternate entry is provided by the existence of the following legal rules:

- (1) in many cases involving ‘scientific’ issues, the parties involved are entitled to expert witnesses;
- (2) an expert witness, unlike a lay witness, is permitted to give opinion evidence;
- (3) in many jurisdictions, a scientific expert may bolster his opinion, in open court, with any reasonable supporting or clarifying information. This information could include data that might otherwise be kept from the jury.

Therefore, the broad standard of ‘reasonableness’ will be applied to such evidence, rather than any general acceptance rule or the liberal set of guidelines found in *Daubert*. Not only will the judge as gate keeper have less control over what evidence gets “let in”, but ostensibly peripheral supporting evidence may in fact become central to the case, even determinative in its final outcome.

South Africa, unlike the United States, does not have specific rules of evidence that control the admissibility of scientific evidence. Section 225(1) of the Criminal Procedure Act<sup>175</sup> states that whenever it is relevant in criminal proceedings to ascertain whether any fingerprint, palm-print or footprint of an accused at such proceedings, corresponds to any other finger-, palm- or footprint, or whether the accused has or had “any mark, characteristic or distinguishing feature” or shows or showed any condition or appearance, evidence of such characteristic or distinguishing feature, including the results of any blood test, is admissible. Generally, DNA evidence will also be admissible, and the issue to be determined by the trier of fact concerns the weight that should be given to such evidence.<sup>176</sup> Also of relevance regarding the admissibility

<sup>174</sup> Op cit at 219

<sup>175</sup> Act 51 of 1977. Du Toit *et al* at 24-94 states that the test for admissibility of any evidence mentioned in this section, is its relevance as required by section 210 of the Act.

<sup>176</sup> See *S v Smile & another* (Eastern Cape Division CC 61/93 unreported); *S v Motloutsi* 1996 (1) SACR 78 (C)

of expert scientific evidence in South Africa, are the provisions of sections 212(4) and 212(8) of the Criminal Procedure Act discussed in paragraph 2.2 supra.

## 2.5 The admissibility of unconstitutionally obtained evidence

### 2.5.1 Introduction

The interests that compete when dealing with the court's discretion to exclude unconstitutionally obtained evidence were described by Lord Cooper in *Lawrie v Muir*<sup>177</sup> as follows: "The law must strive to reconcile two highly important interests which are liable to come into conflict – (a) the interests of the citizen to be protected from illegal or irregular invasion of his liberties by the authorities, and (b) the interests of the state to secure that evidence bearing on the commission of the crime and necessary to enable justice to be done shall not be withheld from courts of law on any mere formal or technical grounds."

In terms of the inclusionary rule, all relevant evidence should be admitted no matter how it was obtained.<sup>178</sup> Prior to South Africa's new constitutional dispensation, there were no express legislative provisions regarding the admissibility of unlawfully obtained evidence. Courts in South Africa followed the example of English courts, and generally held that all relevant evidence is admissible and that the exclusion of illegally obtained evidence is at the discretion of the judge.<sup>179</sup>

The exclusionary rule, on the other hand, demands that unconstitutionally obtained evidence be excluded despite its relevance. The exclusionary rule is founded in the concept of due process: improperly obtained evidence, even though relevant, must be excluded if its admission compromises more important values.<sup>180</sup> The exclusionary rule is thus concerned with the

<sup>177</sup> 1959 Scots LT 37 at 39-40 (cited in Schwikkard *et al* at 140)

<sup>178</sup> See Schwikkard *et al* at 141-142 for a discussion on the rationale behind the inclusionary rule.

<sup>179</sup> In terms of section 252 of the Criminal Procedure Act, "the law as to the admissibility of evidence which was in force in respect of criminal proceedings on the thirtieth day of May, 1961, shall apply in cases not expressly provided for by this Act or any other law." South African courts were thus required to refer to English common law in such cases. In terms of this approach there was in principle no bar to the admissibility of relevant evidence obtained in an unlawful manner. See also paragraph 4.1.2.1 *infra* regarding the common law discretion to exclude improperly obtained evidence.

<sup>180</sup> See generally HL Packer *The limits of Criminal Sanction* (1968) at 149-172. See also paragraph 4.2 *infra* regarding Packer's concept of legal guilt.

legality of the criminal process and demands that the police and prosecution operate within a system in which civil liberties and due process are constitutionally guaranteed. In such a system the prosecution's attempt to introduce unconstitutionally obtained evidence may be viewed as a request that the court act contrary to the spirit and sometimes even the express provisions of the Constitution.<sup>181</sup>

## 2.5.2 The approach of the courts since the enactment of the Constitution

### 2.5.2.1 The interim Constitution

The interim Constitution<sup>182</sup> contains no express provision dealing with the admissibility of evidence obtained in breach of the provisions of the Constitution. Section 7(4) of the interim Constitution states, however, that when it is alleged that any right entrenched in the Bill of Rights has been threatened or infringed, a person may apply to a competent court for appropriate relief.<sup>183</sup>

The admissibility of unconstitutionally obtained evidence under the interim Constitution was considered in *S v Melani*.<sup>184</sup> In this case the court rejected both the rigid exclusionary, as well as the strict inclusionary approach to the admissibility of such evidence. Froneman J found that a strict exclusionary approach failed to take into account the interests of the community as a whole.<sup>185</sup> On the other hand, the strict inclusionary approach was considered inappropriate in a legal system which recognised the supremacy of the Constitution and it denied the court the opportunity of granting effective 'appropriate relief'. The court thus favoured the application of a discretionary approach, which allowed the court to admit evidence if the exclusion of that evidence would bring the administration of justice into discredit and dishonour.<sup>186</sup> The court noted that the origins of such an approach could be found in case law prior to the enactment of

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<sup>181</sup> Schwikkard *et al* at 144

<sup>182</sup> Constitution of the Republic of South Africa Act 200 of 1993

<sup>183</sup> A number of Supreme Court decisions have determined that the exclusion of such unconstitutionally obtained evidence may constitute appropriate relief. (See, for example, *S v Botha (1)* 1995 (2) SACR 598 (W); *S v Melani* 1995 (2) SACR 141 (E); *S v Melani* 1996 (1) SACR 335 (E))

<sup>184</sup> 1995 (2) SACR 141 (E)

<sup>185</sup> *Melani* (1995) at 151c-g

<sup>186</sup> At 151i-j

the interim Constitution.<sup>187</sup> The court in *Melani* (1995) was of the opinion that this discretionary approach provided the best mechanism for the balancing the legitimate interests of the accused against those of the community at large.<sup>188</sup> In a later judgement<sup>189</sup> the court held that section 25 of the interim Constitution<sup>190</sup> provided a further need for the exclusion of unconstitutionally obtained evidence “namely the need to ensure the fairness and integrity of the criminal process at least from arrest and up to and including the trial”.<sup>191</sup>

In *S v Motloutsi*<sup>192</sup> the court found the test whether the admission of unconstitutionally obtained evidence would bring the administration of justice into disrepute, as espoused in *Melani*, unsatisfactory. Farlam J favoured the approach taken by the Irish courts in *People v O'Brien*<sup>193</sup> where it was held that the court had a discretion to exclude illegally obtained evidence when public policy, based on the balancing of public interest, requires such exclusion.<sup>194</sup> However, the court found that a stricter approach was needed where the evidence was obtained as a consequence of a deliberate breach of the accused’s constitutional rights.<sup>195</sup> In such as case, Farlam J held, the evidence should only be admitted if “extraordinary excusing circumstances exist, such as the imminent destruction of vital evidence or the need to rescue a victim in peril” or when the evidence is obtained by “a search incidental to and contemporaneous with a lawful arrest although made without a valid search warrant”.<sup>196</sup> The court stressed that a claim of ignorance of law would not assist police officials in contradicting an allegation that there had been a deliberate and conscious breach of the accused’s rights.<sup>197</sup>

In *S v Malefo and others*<sup>198</sup> Strydom J stated<sup>199</sup> that a court had three options when dealing with unconstitutionally obtained evidence:

<sup>187</sup> See for example, *S v Ebrahim* 1991 (2) SA 553 (A) and *S v Hammer* 1994 (2) SACR 496 (C). For a discussion on the exercise of judicial discretion with respect to unconstitutionally obtained evidence under both the interim and final Constitutions, see F Schutte ‘Uitsluiting van getuienis ingevolge artikel 35(5) van die Grondwet’ (2000) 13(1) *South African Journal for Criminal Justice* 57

<sup>188</sup> At 153b-e

<sup>189</sup> *S v Melani* 1996 (1) SACR 335 (E)

<sup>190</sup> Section 25 of the interim Constitution deals with the right of arrested and detained persons to a fair trial.

<sup>191</sup> *S v Melani* (1996) at 351b

<sup>192</sup> 1996 (1) SACR 78 (C)

<sup>193</sup> 1965 IR 142

<sup>194</sup> *Motloutsi* at 84i-j

<sup>195</sup> At 85b

<sup>196</sup> At 85-86 citing *People v O'Brien* supra

<sup>197</sup> See the discussion infra regarding ignorance of the law and good faith of the police

<sup>198</sup> 1998 (2) BCLR 187 (W)

<sup>199</sup> At 203C-D

- (1) the court could apply a strict exclusionary rule as in the United States of America, where only a few technical exceptions exist to the general exclusionary rule;
- (2) the court could admit such evidence, unless the admission would bring the administration of justice into disrepute (the general approach of courts in Canada, Ireland and New Zealand); or
- (3) the court could exclude the evidence, because inclusion of such evidence would bring the administration of justice into disrepute, as was the approach in *S v Melani* (supra).

Strydom J held that before these three options could be considered, the court had to determine whether it had a discretion when considering the admission of unconstitutionally obtained evidence.<sup>200</sup> Referring *inter alia* to *S v Hammer* (supra) and the Irish case of *People v O'Brien* (supra) the court came to the conclusion that it not only had a discretion to exclude evidence which was obtained in an unconstitutional manner, but also a discretion to admit such evidence.<sup>201</sup> The court then proceeded to consider the three approaches it had outlined<sup>202</sup> and found that a rigid exclusionary approach as found in the United States was unacceptable.<sup>203</sup> Instead the court favoured the approach of the Canadian courts, based on section 24(2) of the Canadian Charter of Rights and Freedoms.<sup>204</sup> The court referred to the Canadian case of *R v Collins*<sup>205</sup> and came to the conclusion that when determining whether the exclusion of evidence will bring the administration of justice into disrepute, a court in fact exercises a discretion.<sup>206</sup> Strydom J came to the conclusion that the approach taken by Froneman J in *S v Melani* (supra) was not that different from the Canadian approach.<sup>207</sup> The court in *Malefo* then went on to consider which test it had to apply in order to determine whether the admission of evidence would bring the administration of justice into disrepute.<sup>208</sup> The court relied once

<sup>200</sup> At 203F

<sup>201</sup> At 205I. Although this judgement was delivered after the commencement of the final Constitution, the questions before the court had to be determined on the basis of the provisions of the interim Constitution, because the matter was pending before the final Constitution commenced. See the discussion *infra* on the approach taken by the courts since the enactment of the final Constitution, for example in *S v Naidoo* (*infra*).

<sup>202</sup> At 205J-212J

<sup>203</sup> At 207E-I

<sup>204</sup> Section 24(2) provides that "where... a court concludes that evidence was obtained in a manner that infringed the rights or freedoms guaranteed by the Charter, the evidence shall be excluded if it is established that, having regard to all the circumstances, the admission of it... would bring the administration of justice into disrepute."

<sup>205</sup> (1987) 28 CRR 122

<sup>206</sup> *S v Malefo* at 208B-H

<sup>207</sup> At 209H-I

<sup>208</sup> At 212A-I

again on *R v Collins* (supra)<sup>209</sup> and held that this involved a determination as to whether the admission of such evidence, in the eyes of the reasonable man, dispassionate and fully apprised of the circumstances of that case, would bring the administration of justice into disrepute.<sup>210</sup>

### 2.5.2.2 The final Constitution

Section 35(5) of the final Constitution<sup>211</sup> provides as follows:<sup>212</sup>

“Evidence obtained in a manner that violates any right in the Bill of Rights must be excluded if the admission of that evidence would render the trial unfair or otherwise be detrimental to the administration of justice.”

The application of section 35(5) has been considered in a number of High Court cases. In *S v Madiba*<sup>213</sup> the court was required to consider the admissibility of the discovery of two guns during a search.<sup>214</sup> Acting on reliable information that there were probably firearms on the premises and that persons that were inclined to attack the police were in the vicinity, the police forcibly entered the premises where the accused were sleeping. The defence alleged that the search breached the accused’s constitutional right to privacy and the state conceded this point. Hurt J held that the words ‘if the admission of evidence would render the trial unfair or otherwise be detrimental to the administration of justice’ clearly conferred a discretion and in admitting the evidence favoured the broad discretionary approach adopted by Farlam J in *S v Motloutsi* (supra), in order to avoid the unfortunate circumstances that sometimes arise when a strict exclusionary rule is applied.<sup>215</sup> This approach was also followed in *S v Lottering*<sup>216</sup> where the court stated that a flagrant and deliberate violation of the appellant’s rights would not be

<sup>209</sup> At 136-137

<sup>210</sup> At 213A

<sup>211</sup> Constitution of the Republic of South Africa Act 108 of 1996

<sup>212</sup> In addition section 35(3) of the 1996 Constitution lists the requirements necessary for the existence of a fair trial. In *S v Zuma and others* 1995 (2) SA 642 (CC) the Constitutional Court, interpreting the corresponding provision in the interim Constitution (section 25(3)) held that the right to a fair trial is not limited to those rights specified in this section.

<sup>213</sup> 1998 (1) BCLR 38 (D)

<sup>214</sup> The search was authorised in terms of section 41 of the Arms and Ammunition Act of 1969

<sup>215</sup> At 44C-F. See also *S v Hoho* 1999 (2) SACR 159 (C) where the court held (at 163f-g) that the courts must exercise a careful discretion and not simply construe the Constitution as implying that all evidence which is inconsistent with the provisions thereof should be excluded. Referring to the case of *S v January* 1994 (2) SACR 801 (A) (see infra), the court added that a fair trial requires *reliable* evidence to be produced against the accused and improperly obtained evidence might well not be sufficiently reliable and accurate to be relied upon confidently by a court.

<sup>216</sup> 1999 (12) BCLR 1478 (N)

tolerated under section 35(5) of the Constitution. However, the court pointed out that there are violations which are not deliberate or flagrant and that the policemen in the present case had done what any reasonable policeman would have done under those circumstances.<sup>217</sup> The court held that it would not be detrimental to the interests of justice to admit the evidence and that the magistrate in the court *a quo* had exercised his discretion under section 35(5) correctly.<sup>218</sup>

In *S v Naidoo*<sup>219</sup> the court chose not to follow the approach of the court in *Madiba* (supra) and held that section 35(5) does not permit the courts to approach the question of the admissibility of evidence, unlawfully obtained in violation of any right in the Bill of Rights, on the basis of a wide discretion referred to by Farlam J in the *Motloutsi* case.<sup>220</sup> McCall J held<sup>221</sup> that the so-called judge's discretion under the common law when deciding the admissibility of unlawfully obtained evidence, had been replaced by the enactment of section 35(5). The court found the approach of the Canadian courts useful to the proper application of section 35(5). Referring to *R v Jacoy*<sup>222</sup> and *R v Collins* (supra) the court in *Naidoo* held that in determining whether the admission of evidence will bring the administration of justice into disrepute one must consider: (1) whether the admission of the evidence will affect the fairness of the trial; (2) the seriousness of the violation; (3) the effect of excluding the evidence.<sup>223</sup> The court in the *Naidoo* case accordingly held that a recording of a particular telephone conversation<sup>224</sup> would infringe the privilege against self-incrimination and render the trial unfair, thus the recordings had to be excluded. Taking things a step further, the court also came to the conclusion that the admission of the evidence would be detrimental to the administration of justice.<sup>225</sup> McCall J in

<sup>217</sup> At 1483D-F

<sup>218</sup> At 1483H. The court pointed out that each case has to be judged on its own merits, and that this decision should not be construed as a licence to police officers to ignore the constitutional protection afforded to accused persons.

<sup>219</sup> 1998 (1) BCLR 46 (D). Also reported as *S v Naidoo and another* 1998 (1) SACR 479 (N)

<sup>220</sup> *S v Naidoo* at 65E-F

<sup>221</sup> At 66A-B

<sup>222</sup> (1988) 38 CRR 290

<sup>223</sup> At 89J-90G

<sup>224</sup> The recording of the conversation was found to be in contravention of the Interception and Monitoring Act 127 of 1992 in that the police officials had obtained authority to monitor the conversation under false pretences.

<sup>225</sup> At 136. In doing so the court applied the reasonable person test used in *R v Collins* (supra). In terms of this test the court is required to take into account the views of the reasonable person, who is usually the average person in the community, "but only when the community's current mood is reasonable". However, the court when exercising this discretion must consider long-term community values and not "render a decision that would be unacceptable to the community when that community is not being wrought with passion or otherwise under passing stress due to current events."

*Naidoo* also uttered the *dictum* that evidence obtained as a result of a deliberate and conscious violation of a constitutional right should be excluded “save where there are extraordinary excusing circumstances.”<sup>226</sup> This *dictum* was qualified in the later case of *S v Mkhize*<sup>227</sup> where Willis J held that “the decision of a trial court in terms of section 35(5) of the Constitution should not be fettered by the importation of any qualification of the nature mentioned by McCall J.”<sup>228</sup>

In *S v Mphala*<sup>229</sup> the court excluded two confessions (which met the requirements for admissibility in terms of section 217 of the Criminal Procedure Act) on the basis of section 35(5) of the Constitution. In this case, though requested by an attorney not to make arrangements for the accused to make statements or be involved in any pointing out until he had had an opportunity to consult with them, the investigating officer recorded the confessions of the accused before they had an opportunity to consult with the attorney. Despite the fact that the accused had been informed of their right to remain silent, their right to legal representation and their right not to be compelled to make a confession or an admission, the court excluded both confessions. The court held<sup>230</sup> that the failure of the investigating officer to advise them of their legal representative’s request effectively violated their right to remain silent, their right to legal representation and the right not to be compelled to make an admission or confession. The court held further that it could not be said that the accused had waived their constitutional rights, since they had not been fully informed of all the relevant facts to exercise their election.<sup>231</sup> The court consequently held that the admission of the evidence would render the trial unfair, and in addition, would also be detrimental to the interests of justice. In the circumstances the evidence should thus be excluded.<sup>232</sup>

<sup>226</sup> See *S v Naidoo and another* 1998 (1) SACR 479 (N) at 499h-i

<sup>227</sup> 1999 (2) SACR 632 (W)

<sup>228</sup> *S v Mkhize* at 637b-c. The court in *Mkhize* also referred (at 637g-h) to *R v Collins* (supra) and *R v Jacoy* (supra). Both these cases stressed that the test for admission of real evidence is less stringent than that for other evidence. In *Jacoy* it was said that the admission of real evidence “irrespective of the Charter violation will rarely render the trial unfair.” It is furthermore pointed out that the administration of justice may be brought into disrepute by excluding evidence, even though improperly obtained.

<sup>229</sup> 1998 (4) BCLR 494 (W). (See also *S v Mphala* 1999 (4) BCLR 481 (W))

<sup>230</sup> *S v Mphala* (1998) at 503H-504A

<sup>231</sup> *S v Mphala* (1998) at 504B-C

<sup>232</sup> It is not clear from the judgement in *Mphala* whether the infringement of one or more of the rights recognised as a prerequisite for a fair trial was sufficient to merit exclusion of the evidence. A better view might be that once a court has found that there has been an unjustifiable infringement of the right to a fair trial, section 35(5) demands its exclusion, that is, the court does not enjoy a discretion. See also the discussion on the application of section 36 of the final Constitution infra.

In *S v Kidson*<sup>233</sup> the court had to determine the admissibility of a recording and a transcript of a conversation between the accused and an accomplice under police surveillance. One of the objections to the admission of the recording was based on the provisions of section 35(5) in that the police procedure infringed the accused's right to privacy.<sup>234</sup> Cameron J held that although section 35(5) of the Constitution only had express application when the Bill of Rights was violated, a similar approach should be followed where evidence was obtained in breach of a statute, as "its admission may in some manner imperil the accused's right to a fair trial".<sup>235</sup> He held further that an important factor influencing the court's discretion to admit the evidence was the extent and flagrancy of the statutory contravention.<sup>236</sup> The court found in this case that the contravention, if it had in fact occurred, was minimal and merely a formal violation that had not resulted in the invasion of privacy and thus concluded that the tape recording and transcription were admissible into evidence. A similar situation to that in the *Kidson* case occurred in *S v Dube*.<sup>237</sup> In this case the appellant based his appeal *inter alia* on section 252A of the Criminal Procedure Act<sup>238</sup> and one of the questions before the court was whether the admission of the evidence of the entrapment rendered the trial unfair or was otherwise detrimental to the administration of justice. Referring to the case of *S v Hassen and another*<sup>239</sup> the court pointed out that entrapment had never been a defence in South African law, and prior to the advent of the Constitution, there had never been an exclusionary rule nor a discretion to exclude evidence in cases involving police traps.<sup>240</sup> The court then considered several judgements regarding police traps decided since the advent of the interim Constitution<sup>241</sup> and came to the conclusion that a court has a discretion to exclude evidence of entrapment, but that it will depend on the circumstances of each case.<sup>242</sup>

<sup>233</sup> 1999 (1) SACR 338 (W)

<sup>234</sup> The accused also objected to the admissions of the evidence on the basis that it contravened the Interception and Monitoring Prohibition Act 127 of 1992. The court found that the provisions of this Act had not been contravened in this instance of participant monitoring.

<sup>235</sup> At 349e

<sup>236</sup> At 350h

<sup>237</sup> 2000 (1) SACR 53 (N). (Also reported as *S v Dube* 2000 (6) BCLR 685 (N))

<sup>238</sup> Section 252A of the Criminal Procedure Act 51 of 1977 concerns the authority to make use of traps and undercover operations and the admissibility of evidence so obtained. This section was only enacted in 1996, and in the *Dube* case the court held that the section is not retrospective (at 71c-d) and only pertains to officials in employ of the state, and not to private persons (at 76a-b).

<sup>239</sup> 1997 (2) SA 253 (T)

<sup>240</sup> At 71g-i

<sup>241</sup> The court referred *inter alia* to *S v Desai* 1997 (1) SA 845 (W) and *S v Hayes en 'n ander* 1998 (1) SACR 625 (O).

<sup>242</sup> At 73e-f

### 2.5.3 The limitation of rights and the concept of good faith

It should be borne in mind that no right in the Bill of Rights is absolute and unconditional<sup>243</sup> and that the limitations clause<sup>244</sup> will usually be applied before the constitutional exclusionary rule will come into play. A person arguing for the exclusion of evidence, on the basis that it was obtained in contravention of the accused's right to a fair trial, would thus not succeed with their argument if the prosecution persuaded the court that the violation of their constitutional rights was reasonable and justifiable within the context of the limitations clause.<sup>245</sup> The Constitutional Court has, in a number of judgements, adopted a purposive, though generous approach in interpreting the Constitution.<sup>246</sup> The evaluation of any limitation of a protected right takes place in two stages: Firstly, it has to be established whether or not the limitation constitutes an infringement of the right, and if this is the case, the second step is to establish whether the limitation is necessary and justified.<sup>247</sup> According to the Constitutional Court in *S v Makwanyane* (supra) this involves a weighing up of the competing values or interests on the basis of proportionality.<sup>248</sup> There is no standard process that can be applied in this regard. It will depend on the facts and circumstances of each case.<sup>249</sup> A proportionality assessment must be done with reference to the purpose of the limitation in question: the nature and extent of the limitation should be in the same scale as the importance and purpose of the limitation.<sup>250</sup>

The question sometimes arises whether the fact that the police acted in good faith in obtaining what turns out to be unconstitutionally obtained evidence, should be a factor which favours the admission of such evidence. According to Van der Merwe<sup>251</sup> if the admission of such evidence

<sup>243</sup> *Director of Public Prosecutions: Cape of Good Hope v Bathgate* 2000 (2) BCLR 151 (C) at 169J

<sup>244</sup> As is found in section 33 of the interim Constitution and section 36 of the final Constitution. The interpretation and application of these two sections correspond, even though there are differences in the formulation of the two sections (see the *Bathgate* case (supra) at 170C-D).

<sup>245</sup> Schwikkard *et al* at 150

<sup>246</sup> See generally *Director of Public Prosecutions: Cape of Good Hope v Bathgate* (supra) at 168D-F, where the court cites the following cases: *S v Zuma and others* 1995 (4) BCLR 401 (CC); *S v Makwanyane and another* 1995 (6) BCLR 665 (CC); *Ferreira v Levin NO and others* 1996 (1) BCLR 1 (CC); *S v Williams and others* 1995 (7) BCLR 861 (CC).

<sup>247</sup> *Bathgate* (supra) at 171I-172B. The onus of proving the limitation is justified rests upon the person averring it.

<sup>248</sup> At paragraph [104]

<sup>249</sup> *Bathgate* (supra) at 170G

<sup>250</sup> *Bathgate* at 171B-D

<sup>251</sup> SE Van der Merwe 'The 'good faith' of the police and the exclusion of unconstitutionally obtained evidence' (1998) 11 *South African Journal of Criminal Justice* 462 at 464

would render the trial unfair, the evidence should as a rule be excluded irrespective of whether the police acted in good or bad faith. However, if the court concludes that the admission of the evidence would not render the trial unfair, it must still proceed to the second leg of the test in section 35(5), namely whether admission of the evidence would 'otherwise be detrimental to the administration of justice'. The author is of the opinion that section 35(5) forms an essential part of a constitutional due process system, which not only guarantees certain substantive and procedural rights, but also places important limitations on official power. In *S v Naidoo* (supra) it was also held that section 35(5) protects the integrity of the courts.<sup>252</sup> Another purpose served by excluding unlawfully obtained evidence is to discourage unconstitutional police conduct. The exclusionary rule has a deterrent and educative function that ultimately has a preventative effect.<sup>253</sup> Exclusion of evidence in a case where the police, despite exercising reasonable care, were incorrect in their conclusion that they were complying with the provisions of the law, would serve no deterrent function. However, an exclusionary rule which allows a 'good faith' exception, creates a risk of encouraging police officials to remain ignorant of their legal duties and the constitutional rights of suspects and arrested persons.<sup>254</sup> In *S v Motloutsi*<sup>255</sup> the court referred to a passage from *People v Shaw*<sup>256</sup> which states that the existence of such an exception could lead to an absurd position, namely, that the less a police officer knew about the Constitution and the law, the more likely he would be to have evidence, which he obtained in breach of the law and the Constitution, admitted in court.

In *S v Madiba* (supra), the prosecution conceded that they had infringed the accused's right to privacy. However, the court carefully considered the reasons the police officers gave for the forced entry and concluded that in the interest of the safety of the police, the community and the accused themselves, the form of entry was warranted.<sup>257</sup> The court was of the opinion that the infringement of the right to privacy paled into significance compared to the importance of

<sup>252</sup> See *S v Naidoo* at 94C

<sup>253</sup> SE Van der Merwe 'Unconstitutionally obtained evidence: Towards a compromise between the common law and the exclusionary rule' (1992) 2 *Stellenbosch Law Review* 173 at 189. See, however, CM Bradley 'The emerging international consensus as to criminal procedure rules' (1993) 14 *Michigan Journal of International Law* 171 who states (at 219) that though exclusionary remedies are finding increasing favour as a means of deterring police misconduct, the courts of at least two countries, namely Canada and Germany, continue to maintain that the deterrence of such police misconduct is not the purpose of the exclusionary rule.

<sup>254</sup> Van der Merwe (1998) at 465-466

<sup>255</sup> Supra at 87f-j

<sup>256</sup> (1928) IR 1 at 33-34

<sup>257</sup> See *S v Madiba* at 44I-45D

the achievement of the object which the police had in carrying out their duties.<sup>258</sup> The court pointed out that this decision should not be seen as a blanket authority for the use of unorthodox methods by police officials, but that each case will ultimately be decided on its own facts.<sup>259</sup> The case of *S v Gumede and others*,<sup>260</sup> for example, involved a search and seizure which was clearly conducted in a manner which breached the accused's right to privacy. The court found that the infringement was justified in light of section 33 of the interim Constitution since the premises were situated in a notoriously violent area and the police were aware that at least one of the residents was in possession of a firearm.<sup>261</sup> In the American case of *New York v Quarles*<sup>262</sup> the Supreme Court of the United States held that there was a "public safety" exception to the requirement that Miranda warnings be given.<sup>263</sup> An interesting twist in the good faith issue occurred in the case of *S v Soci*<sup>264</sup> where the court, in applying section 35(5), admitted the accused's confession to a magistrate but excluded the evidence of a pointing-out by the accused in the presence of the police. The accused was not informed of his right to consult with a legal practitioner during the pointing-out and the court held that this violated a fundamental right of the accused.<sup>265</sup> The court conceded that the violation was neither *mala fide* nor conscious in that the investigating officer complied conscientiously with departmental prescriptions, in accordance with a form supplied for such purposes. Rather the fault lies with the form drafted by the legal advisers of the South African Police Services.<sup>266</sup> The good faith of the individual police officers in this case thus becomes irrelevant when the South African Police Services issue directives which do not comply with the constitutional provisions. Van der Merwe<sup>267</sup> is of the opinion that in such a situation it would be detrimental to the administration of justice to admit the evidence, despite the good faith and reasonable conduct of the officers concerned.

<sup>258</sup> At 45D

<sup>259</sup> At 45E

<sup>260</sup> 1998 (5) BCLR 530 (D)

<sup>261</sup> At 537E-538F

<sup>262</sup> 467 US 649 (1984) cited in Van der Merwe (1998) at 470

<sup>263</sup> Van der Merwe (1998) states (at 471) that the finding in *Quarles* indicates an objective test: in this case as well as in *Madiba*, the officers only overstepped the 'constitutional line' in so far as it was necessary to eliminate risks to public safety. This can be seen as a clear indication of good faith and reasonable conduct. The exclusion of unconstitutionally obtained evidence must thus always be considered in the context of the realities that police officers face in the execution of their duties.

<sup>264</sup> 1998 (2) SACR 275 (E). Also reported as *S v Soci* 1998 (3) BCLR 376 (E).

<sup>265</sup> *S v Soci* at 296b

<sup>266</sup> At 296c

<sup>267</sup> (1998) at 472-473

#### 2.5.4 Scientific evidence and the Constitution

In the recent case of *S v R*<sup>268</sup> the admissibility or not of DNA-fingerprints, produced from blood samples obtained from several accused, in violation of their Constitutional rights, was at issue. During the investigation of a number of rapes, the Director of Public Prosecutions instructed the investigating officer to obtain blood samples from two accused who were both minors.<sup>269</sup> The intention was to subject the blood samples to DNA testing, and compare the profiles obtained from the blood samples to those produced from vaginal samples from several complainants.<sup>270</sup> The court held that there could be no doubt that blood tests entail an invasion of a person's privacy.<sup>271</sup> The court went on to consider several decisions regarding the operation of section 35(5) of the final Constitution<sup>272</sup> and particularly the balancing of interests that is required when considering whether to admit or exclude unconstitutionally obtained evidence. The court finally admitted the DNA evidence based on the fact that it clearly may be relevant<sup>273</sup> and that there "are substantial benefits to be derived from harnessing the advances of modern science to the law."<sup>274</sup> The court, per Willis J, was of the opinion<sup>275</sup> that DNA testing "can go a long way towards liberating men from their fear of being falsely accused of rape. It can also go a long way towards liberating women from the humiliating questions they so often have to be subjected to when complaining and testifying in rape cases." The court, however, expressed its awareness of the fact that the taking of blood samples could enable tests to be conducted that could provide information about diseases and genetic defects that could be embarrassing to an accused.<sup>276</sup> Willis J thus qualified the order to admit the DNA evidence by requiring that before it would be received, satisfactory evidence by the State that

<sup>268</sup> 2000 (1) SACR 33 (W)

<sup>269</sup> One of the issues before the court was whether the accused had in fact consented to the blood tests. The court considered the evidence of the investigating officer, as well as the accused (at 36h-39b) came to the conclusion (at 39c and 42f-43h) that they had in fact consented.

<sup>270</sup> See paragraph 3.1 *infra* regarding the methodology of DNA profiling.

<sup>271</sup> At 39i-j. The court referred *inter alia* to *Seetal v Pravitha and another NO* 1983 (3) SA 827 (D), where Didcott J held that in the case of an adult an involuntary blood test unquestionably constituted an invasion of privacy. However, in that case the court also pointed out that the privacy of an individual is not inviolable in our law, and that it may on occasion have to yield to other considerations of legal policy. Similarly, in *D v K* 1997 (2) BCLR 209 (N) it was held that an involuntary blood test constituted an invasion of privacy.

<sup>272</sup> *Inter alia S v Naidoo and another (supra), S v Mphala (supra) and S v Zuma (supra).*

<sup>273</sup> At 43h-i

<sup>274</sup> At 39d

<sup>275</sup> At 39g

<sup>276</sup> At 44a-b

no test had been done or will be done on the blood samples, other than the tests that are necessary for the purposes of the trial.<sup>277</sup>

In *Sapat and others v Director: Directorate for Organised Crime and Public Safety and others*<sup>278</sup> the applicants, from whom blood, hair and saliva samples had been forcibly taken, approached the court in order to have sections 37(1)(c), 37(2) and 37(3) of the Criminal Procedure Act of 1977 unconstitutional and thus invalid.<sup>279</sup> The applicants alleged that section 37 permits expressly or by implication, the taking of blood or other bodily samples from persons without their consent, and in circumstances where the taking of such samples was not relevant to the procurement of proof in terms of the charges upon which such persons had been arrested.<sup>280</sup> In addition, the applicants sought to have section 225(1) of the Criminal Procedure Act declared invalid, in that it stipulates that the results of the analyses of blood and other bodily samples of an arrested person shall constitute admissible evidence, regardless of whether or not such samples were obtained in circumstances where the taking was irrelevant to the charges upon which such a person was arrested.<sup>281</sup> The court in *Sapat* stated<sup>282</sup> that when dealing with the exercise of a positive discretion, consideration must be given to the court's reluctance to deal with academic questions or disputes which are wrenched from a factual context.<sup>283</sup> Applying the doctrine of ripeness, the court held that the issues before it should be grounded in a concrete relief, whether this relates to the present or future conduct which

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<sup>277</sup> At 44c-f

<sup>278</sup> 2000 (2) BCLR 200 (C)

<sup>279</sup> Section 37 of the Criminal Procedure Act permits a police official to take fingerprints, palm-prints and footprints of arrested persons, and subsection (1)(c) permits said official to take such steps as he deems necessary to determine if the body of such a person has any mark, characteristic or distinguishing feature. Subsection (2) gives a medical officer of a prison, or a district surgeon the power to take the necessary steps, at the request of a police official to *inter alia* take blood samples. Subsection (3) permits the court before which criminal proceedings are pending, to order that prints may be taken, or the presence of a distinguishing feature be determined, by for example, taking of blood sample, in cases where the police official is not empowered under subsection (1) to do so.

<sup>280</sup> At 203D-E

<sup>281</sup> At 203F-G. The accused also sought to have section 225(2) declared unconstitutional and thus invalid. This section states that evidence obtained in terms of section 225(1) shall not be inadmissible by reason only thereof that such mark or print or distinguishing feature was not ascertained in accordance with the provisions of section 37, or that it was ascertained against the wish or will of the accused.

<sup>282</sup> At 206F

<sup>283</sup> The applicants had brought an urgent application by way of Notice of Motion to the High Court, while the case was still being heard by a lower court. The court cited (at 205D-E) the case of *Slingsby v The Attorney-General of the Western Cape* (unreported decision of the CPD; case No. 16645/97) where it was stated that the general rule is that it is undesirable in criminal proceedings to entertain appeals and/or reviews before the trial has been concluded.

infringed the rights of the applicants, or (such as damages) that relates to past conduct.<sup>284</sup> The court was of the opinion that the present contentions by the applicants would be best considered by a trial court appraised of all the facts relating to the dispute. Even if one assumes the merits of the argument that sections 37 and 225 of the Criminal Procedure Act are unconstitutional, a declaration of unconstitutionality has to take into account not only the breach of a constitutional right, but further has to consider the question whether such a limitation is justified in terms of section 36 of the final Constitution.<sup>285</sup> The court referred with favour to *Key v The Attorney-General, Cape of Good Hope Provincial Division and Another*<sup>286</sup> where Kriegler J held that what the Constitution demands is that the accused be given a fair trial. Ultimately, fairness is an issue which has to be decided upon the facts of each case, and the trial judge is the person best placed to make that decision. At times fairness might require that evidence unconstitutionally obtained be excluded. But there will also be times when fairness will require that evidence, albeit obtained unconstitutionally, nevertheless be admitted.<sup>287</sup> Thus, in the opinion of the court in *Sapat*, if the evidence to which the applicant objects is tendered in criminal proceedings against him, he will be entitled at that stage to raise objections to its admissibility.<sup>288</sup>

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<sup>284</sup> At 206I

<sup>285</sup> At 206F-H

<sup>286</sup> 1996 (6) BCLR 788 (CC)

<sup>287</sup> *Key* at paragraphs 13-14

<sup>288</sup> See *Sapat* (supra) at 205F-H

## CHAPTER THREE

### EXAMPLES OF SCIENTIFIC EVIDENCE PRESENTED IN COURT

#### 3.1 DNA evidence

##### 3.1.1 The theory and techniques behind DNA profiling

The human genome consists of three billion base pairs of deoxyribonucleic acid (DNA), and although more than 99 per cent of the human DNA sequence is identical, some three million base pairs are variable among humans.<sup>289</sup> There are basically two types of DNA in all individuals: repetitive sequence DNA and non-repetitive sequence (or unique) DNA. The unique DNA is the 'coding' DNA and carries the information necessary for an individual to express certain genetic traits.<sup>290</sup> The repetitive sequence DNA is 'non-coding' and consists of moderately repetitive sequences and highly repetitive sequences. The highly repetitive sequences, which are only 15-30 base-pairs long, are repeated millions of times.<sup>291</sup> When these small sequences are tandemly attached, they are called variable number of tandem repeat (VNTR) loci, are assumed to vary greatly from one individual to another, and these are the loci that DNA profiling techniques seek out.<sup>292</sup> While each person's DNA has many different VNTR's, a particular VNTR sequence is found in a relatively small number of people.<sup>293</sup>

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<sup>289</sup> Bennett at 144; Goodwin and Meintjies-Van der Walt at 153. Structurally, DNA is a long, thread-like molecule consisting of billions of deoxyribonucleotides. Each comprises a sugar and a phosphate group, as well as one of four nitrogenous bases, namely, adenine, guanine, cytosine, and thymine. DNA exists in the cell as a double-stranded molecule in which complementary bases (adenine with thymine and guanine with cytosine) from either strand are weakly bonded. It is the sequence in which these base pairs are arranged along the length of the molecule that confers genetic traits on an organism.

<sup>290</sup> Goodwin and Meintjies-Van der Walt at 153. Hereditary information is organised into structural and regulatory genes, which code for the manufacture of amino acids. Genes are organised on chromosomes together with several forms of non-coding DNA. The human genome is contained in 23 pairs of chromosomes, one of a pair originating from each parent. The region in which a gene or gene cluster occurs on a chromosome is called a locus. A gene occurs at the same locus on both pairs of chromosomes. However, the base sequence of the two copies of the gene may vary, and each variant form of a genetic locus is termed an allele. A single genetic locus may be characterised by several alleles and is then referred to as a polymorphic locus. An individual may have no more than two different alleles for a given gene, but, collectively, a population can have several different alleles at a given locus. It is this polymorphism which forms the basis of DNA typing.

<sup>291</sup> Bennett at 144-145

<sup>292</sup> M Redmayne 'Doubts and Burdens: DNA Evidence, Probability and the Courts' (1995) *Criminal Law Review* 464 at 465

<sup>293</sup> O Mooki 'DNA Typing as a Forensic Tool: Applications and Implications for Civil Liberties' (1997) 13 *South African Journal on Human Rights* 565 at 565. The observation that VNTR's in specific loci in the genome are highly variable means that every person has, theoretically, a unique composition of VNTR's.

The most commonly used method of establishing a DNA-fingerprint<sup>294</sup> is by the use of restriction fragment length polymorphisms (RFLP).<sup>295</sup> This process consists of nine stages:<sup>296</sup>

- (a) The first stage is chemical extraction of the DNA from the sample, for example, a bloodstain on clothing.
- (b) The second stage is fragmentation of the DNA by restriction enzymes. These enzymes cut DNA strands at specific base sequences. The fact that each individual has unique DNA will cause the length of the DNA segment cut by the enzyme to vary from individual to individual.<sup>297</sup>
- (c) The third stage is gel electrophoresis, whereby the DNA fragments are separated by length.
- (d) The fourth stage is the denaturing of the DNA, a process whereby the double stranded DNA is 'unzipped' and becomes single stranded.
- (e) The fifth stage is Southern blotting, which transfers the DNA fragment to a nylon membrane. The DNA fragments bind to the nylon membrane in the same position as they were on the electrophoretic gel.
- (f) The sixth stage is hybridisation of the DNA. During this process, a radioactive 'probe' or reagent is applied to the DNA. The probe complements a single stranded base sequence that appears in or adjacent to the highly polymorphic site.
- (g) The seventh stage is autoradiography, whereby the product of the hybridisation stage is placed in contact with an X-ray film. Bands or fingerprints will appear on the film where the probe has bound to the DNA. It is this banding pattern that is the DNA-

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<sup>294</sup> The term 'DNA-fingerprinting' was coined in AJ Jeffreys, V Wilson and SL Thein 'Individual Specific Fingerprints of Human DNA' (1985) 316 *Nature* 76. The term is a misnomer in the sense that it suggests that DNA-fingerprinting, like ordinary fingerprints, offers a unique identification marker. Homozygotic identical twins will however, have the exact same DNA-fingerprint, yet nonetheless exhibit different 'ordinary' fingerprint patterns.

<sup>295</sup> Recent advances in DNA hybridisation technology and the polymerase chain reaction (PCR) are now being applied to forensic investigations. PCR generates a profile by mapping individual DNA nucleotides within a particular locus, generating so-called 'digital genetic information'. The use of the PCR has a distinct advantage in that it enables the use of extremely small amounts of DNA from any biological tissue, as well as partially degraded genetic material from old or exposed samples. In addition, PCR offers a more robust means of generating a DNA profile in that it dispenses with problems such as matching and measurement errors that are associated with RFLP analysis (see discussion *infra*). See Mooki at 567 and Goodwin and Meintjies-Van der Walt at 154.

<sup>296</sup> JL Taitz 'DNA-fingerprinting as a forensic identity test – a reappraisal' (1992) 109 *South African Law Journal* 270 at 272-273. Professor Alec Jeffreys developed the technique of DNA-fingerprinting, in 1985 at Leicester University.

fingerprint and which may be likened to a commercial bar code. The position of the bands reflects the length of the DNA fragments produced by the cleaving of the DNA at polymorphic sites by the restriction enzymes.

- (h) The eighth stage is the interpretation of the DNA-fingerprint. The DNA-fingerprint is compared to a DNA-fingerprint produced from the victim, or suspect. It is possible to make a visual determination, but due to the complexity of DNA-fingerprints, it is advisable that interpretation be made by computer. This is done by converting band positions into numerical codes, in order to determine the closeness of the pattern of two DNA-fingerprints.
- (i) The ninth and final stage is the conversion of the results into a statistical probability. The frequency of the allele in a given population has to be assessed and the final statistic is usually expressed in terms of the odds of the occurrence of a particular allele in the relevant population.

### 3.1.2 Potential errors and limitations of forensic DNA profiling

Given that a legal verdict could depend on DNA evidence, the need to ensure optimal testing conditions is paramount. Errors, which may occur during the various steps of the DNA profiling procedure, might render the results incorrect.<sup>298</sup> Examples of such possible sources of error are:<sup>299</sup>

- 1) The question of contamination arises wherever DNA analysis is concerned. Contamination of the sample with foreign DNA can occur at any stage of the procedure. Samples which lie at a crime scene for any length of time, may be exposed to contamination through incidental contact with another DNA source. PCR carryover, due to accidental contamination of a DNA sample prior to amplification, can occur where DNA extraction and PCR amplification occur simultaneously or in close proximity.
- 2) Degradation of crime scene samples, which are often exposed to harsh elements and the influences of weather, bacteria and chemicals might occur.
- 3) Many problems can occur during gel electrophoresis. An excess of sample placed in an electrophoretic gel may cause the radioactive blot to be too intense for examination or may

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<sup>297</sup> Since different restriction endonucleases cut the DNA at different loci, the profile obtained by RFLP analysis would depend on the type of restriction enzyme used (see Mooki at 567).

<sup>298</sup> See for example, the objections to the DNA fingerprinting procedures in *R v Tran* (infra).

cause two bands to appear as one fragment. Since suspect and crime scene samples are often run in adjacent wells on a gel, overloading of wells may cause cross contamination, invalidating the results.

- 4) During the hybridisation process, the probe on occasion may bind to the wrong DNA sequence, and if it is a sequence common to all individuals, a match will occur on all samples tested.

Also of vital importance in forensic DNA profiling, is the use of appropriate controls. It provides a means of ensuring that every stage of the procedure occurs within the specification of the reagents and the equipment and that the results obtained are not artefactual.<sup>300</sup>

### 3.1.3 A brief overview of the use and admissibility of DNA evidence in various jurisdictions

The DNA fingerprinting technique was initially developed by medical scientists and geneticists to investigate human hereditary diseases, but more recently the technique has been heralded as the solution to the positive identification of suspects in cases extending from murder to disputed paternity.<sup>301</sup>

In 1987, in the English case of *R v Pitchfork*,<sup>302</sup> although there was no necessity for the production of evidence of DNA-fingerprinting, it was most probably the criminal's fear of being discovered by such evidence, that caused him to bribe an acquaintance to give a blood specimen in his place, and eventually to his confessing to two murders. In *R v Melias*<sup>303</sup> a DNA-fingerprint obtained from semen found on the clothes of a rape victim matched the DNA-fingerprint from a sample of the accused's blood. During the trial, the accused changed his

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<sup>299</sup> See generally Bennett at 154-157; Goodwin and Meintjies-Van der Walt at 158-161.

<sup>300</sup> Goodwin and Meintjies-Van der Walt at 161. For example, VNTR profiling requires the use of controls to validate electrophoretic conditions. These include the use of regularly spaced molecular weight markers to ensure the samples are running evenly along the width of the gel, and the use of allelic markers, where samples of known profile are run concurrently with test samples. Negative controls (samples containing no DNA) should be included to ensure a lack of reagent contamination.

<sup>301</sup> C Martin 'DNA profiling' (1998) *De Rebus Procuratoris* 67 at 67. The first documented use of the DNA profiling technique in a forensic setting, occurred in the United Kingdom in 1985, when British immigration officials relied on the DNA test in the positive identification of a Ghanaian boy who wished to be reunited with his mother and fellow siblings in England.

<sup>302</sup> 1990 *Criminal Law Reports* 479. See Taitz at 274. See also N McLeod 'English DNA Evidence Held Inadmissible' (1991) *Criminal Law Review* 583 at 583.

plea to one of guilty when faced with the DNA evidence. The *Melias* case is believed to be the first in which the accused person was convicted following the presentation of DNA-fingerprinting evidence.<sup>304</sup> In subsequent cases in the United Kingdom, where DNA-fingerprinting evidence was accepted as positive and conclusive identification of the accused, it would appear that in none of these cases the DNA evidence was seriously contested by the accused<sup>305</sup> until the case of *R v Gordon*.<sup>306</sup>

DNA fingerprinting as a means of forensic identification also became available in the United States. The first case, in which a conviction was based almost exclusively on DNA-fingerprinting evidence, was the Florida rape case of *State v Andrews*.<sup>307</sup> In the *Andrews* case, the victim could not identify the defendant, there were no eyewitnesses, and the defendant had an alibi. In addition, the circumstantial evidence was limited to a few fingerprints from a screen outside the victim's house. Nonetheless, the court found the defendant guilty when no rebuttal was offered to the DNA evidence.<sup>308</sup> DNA-fingerprints were subsequently used in a series of criminal cases with remarkable success. In most of the cases, the prosecution's threat of producing DNA evidence caused the defence to plead guilty. In cases where the accused sought to contest the accuracy of the DNA evidence, the courts were not sympathetic. Whether this was due to the fact that the courts were overwhelmed by scientific evidence or by the initial extravagant claims of scientists, is a matter of conjecture.<sup>309</sup> The fact remains that

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<sup>303</sup> *The Times* 14 November 1987

<sup>304</sup> Taitz at 274

<sup>305</sup> See generally, A Hall 'DNA fingerprints – black box or black hole?' (1990) 140 *New Law Journal* 203

<sup>306</sup> *R v Gordon (Michael)* (1995) Cr App 290 (CA). The *Gordon* case illustrates the pitfalls of DNA typing evidence arising from a lack of procedural guidelines for the generation of a DNA profile. In this case it emerged that the electrophoretic gels used to determine the profile were developed by two different laboratories, and then sent to a third laboratory for analysis. In addition the expert witnesses could not agree on the acceptable spacing between DNA bands for purposes of interpreting the DNA profile (see Mooki at 569).

<sup>307</sup> 533 So 2d 841 (Florida Dist Ct App 5 Dist 1988). See generally, E Marchi and RJ Pasacreta 'Capillary electrophoresis in the court: The landmark decision of *The People of Tennessee v Ware*' (1997) 4(4) *Journal of Capillary Electrophoresis* 145 at 146. DNA identification evidence has been used in United States courts from as early as 1987. The first criminal prosecution to use DNA evidence was *Commonwealth of Pennsylvania v Pestinikas* (1987), although the DNA evidence in that case was not seen as a crucial piece of evidence. The first criminal case in the United States which used DNA evidence to identify a defendant was *State v Hunt*, a 1987 Oklahoma murder case. The case of *People v Zambrana*, a 1987 New York murder case, was the first criminal case in which DNA evidence was used to identify a suspect who was subsequently convicted. The conviction in this case did not however hinge on the DNA evidence, since there was also eyewitness testimony.

<sup>308</sup> Marchi and Pasacreta at 147. *Andrews* was also the first DNA case to produce an appellate decision on the admissibility of DNA evidence. The Appellate Court confirmed the conviction and, more notably, the admissibility of DNA evidence.

<sup>309</sup> Hall at 204

until the case of *People v Castro*<sup>310</sup> attacks on DNA-fingerprinting evidence met with little or no success. Examples of the pre-*Castro* cases are *State v Andrews* (supra), in which the *Frye* test was used to establish the admissibility of the DNA-fingerprinting evidence. The prosecution produced the independent evidence of two eminent biochemists, who held that the DNA-fingerprinting evidence used in the case was both reliable and accurate (thus proving that the method is sufficiently established to have gained general acceptance in the relevant scientific field). The accused was unable to counter this scientific evidence. On appeal the accused sought to attack the methodology used by the laboratory concerned, but the appeal failed. In *People v Bailey*<sup>311</sup> a complainant, pregnant as the result of rape, underwent an abortion. The prosecution sought to prove that the accused was the assailant by matching DNA-fingerprints obtained from the aborted foetus with the DNA-fingerprint of the accused. Despite objection from the accused, the evidence was admitted and the accused was convicted. In *People v Wesley*<sup>312</sup>, the prosecution sought to produce evidence that a DNA-fingerprint established from bloodstains found on the clothing of the accused, matched the DNA-fingerprint of the murder victim. The accused attacked the reliability of the methodology in establishing the DNA-fingerprints of both the deceased and the accused. However, the evidence of two prominent geneticists, a biochemist from the laboratory concerned and a university professor of biology, convinced the court of the reliability and accuracy of the particular tests. The accused was subsequently convicted.<sup>313</sup>

The turning point in the admissibility of DNA-fingerprinting evidence was the case of *People v Castro* (supra).<sup>314</sup> The facts of this case were that a woman and her two-year-old daughter were found stabbed to death in an apartment. Acting on information received, the police arrested the accused and found dried bloodstains in the grooves of the accused's wristwatch. The prosecution sought to show, using DNA-fingerprinting, that the blood was that of the murdered woman. In terms of the *Frye* standard that was still operative at that time, a pre-trial hearing was held to determine whether DNA-fingerprinting was 'generally accepted as reliable'

<sup>310</sup> 545 NYS 2d 985 (NY Supreme Court 1989)

<sup>311</sup> 140 Misc 2d 306, 533 NYS 2d 643 (1988); discussed in Taitz at 276

<sup>312</sup> 140 Misc 2d 306, 533 NYS 2d 643 (1988) cited in A Pearsall 'DNA printing: The Unexamined "Witness" in Criminal Trials' (1989) 77 *California Law Review* 665 at 693

<sup>313</sup> In both the *Bailey* and the *Wesley* case, the court ruled the tests admissible based on the *Frye* rule (see Pearsall at 693-694).

<sup>314</sup> See generally Taitz at 277-278

by the scientific community. During this pre-trial hearing, the reliability of DNA-fingerprinting in general and the methods used by the relevant laboratory in particular were examined.

The court in *Castro* held the DNA typing evidence inadmissible under a three-pronged modified *Frye* test, by posing three questions.<sup>315</sup>

- a) Is there a theory, which is generally accepted, in the relevant scientific community, which supports the conclusion that DNA forensic testing can produce reliable results?
- b) Are there techniques and experiments that currently exist that are capable of producing reliable results in DNA identification, and which are generally accepted in the scientific community?
- c) Did the testing laboratory perform the accepted scientific techniques in analysing the forensic samples in this particular case?

The third prong represents a modification to the general acceptance standard and has come to represent the reliability requirement for admissibility of DNA evidence. The court in *Castro* acknowledged that some courts have held this enquiry into laboratory performance to go toward the weight of the evidence and not its admissibility.<sup>316</sup> The court held that the theory underlying DNA analysis was generally accepted and thus satisfied the first prong of the test.<sup>317</sup> Further, the court found the tests used to include or exclude suspects sufficiently reliable to satisfy the second prong. However, the court did not find enough evidence to satisfy the third prong, finding that the testing laboratory had failed to conduct the necessary and scientifically accepted tests. Thus the court held the DNA evidence inadmissible as a matter of law.<sup>318</sup>

It would appear that the evidence in the *Castro* case failed the *Frye* criterion because of the following factors:<sup>319</sup>

- 1) An absence of scientific quality control of the methodology actually used to produce the DNA-fingerprints;
- 2) The use of contaminated probes or reagents;

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<sup>315</sup> Bennett at 170-171

<sup>316</sup> *People v Castro* at 987

<sup>317</sup> At 989

<sup>318</sup> At 997-998

<sup>319</sup> See Taitz at 277-278

- 3) An inadequate visual comparison in matching the DNA-fingerprints of the accused and deceased respectively, instead of computerised matching;
- 4) A failure to provide proof that the match might not have arisen by chance in this particular population group (being Hispano-American);
- 5) A failure to establish the probability of matching fingerprints in the population database.

A reliability requirement has also been read into the application of the *Daubert* criteria, in the case of *United States v Martinez*.<sup>320</sup> In the *Martinez* case, the court held that the *Daubert* test requires a preliminary hearing to determine if the testing procedures used in any particular case were reliable. The court qualified this reliability enquiry by noting that minor errors would not warrant exclusion.<sup>321</sup> The effect of this reliability requirement is that errors will have more effect on the weight of the evidence than its admissibility.<sup>322</sup>

DNA fingerprinting as a forensic identification test has also been used successfully by the prosecution in criminal cases in Australia. In two cases, the accused unsuccessfully attacked the reliability of the DNA-fingerprinting evidence.<sup>323</sup> However, in the case of *R v Tran*<sup>324</sup> DNA-fingerprinting evidence was rejected by the court. The facts of the *Tran* case were as follows:<sup>325</sup> a man of 'Oriental appearance' attacked a 17-year-old girl and her 18-year-old boyfriend in a park. The girl was raped and subsequently murdered. Some two months later, the police arrested the accused, a Vietnamese man, who had previous convictions for sexual assault. The question in issue, in the murder and rape case against the accused, was whether the DNA-fingerprints established from vaginal swabs taken from the deceased matched a DNA-fingerprint produced from blood samples taken from the accused. A DNA-fingerprint was also constructed from a blood sample taken from the boyfriend. Evidence that a DNA-fingerprint, produced from the vaginal swab obtained from the deceased, matched that of the accused was found inadmissible by the judge. Firstly, there was doubt as to whether the

<sup>320</sup> 3 F3d 1191 (8<sup>th</sup> Cir 1993). See also paragraph 2.4 *supra*

<sup>321</sup> *United States v Martinez* at 1197-1198. See also Bennett at 171.

<sup>322</sup> RS Kramer 'Admissibility of DNA Statistical Data: A Proliferation of Misconception' (1993) 30 *California Western Law Review* 145 at 157-158

<sup>323</sup> *R v Elliott* (unreported judgement of the Supreme Court of New South Wales; Case number 70154/98) and *R v Brown* (unreported judgement of the Supreme Court of Tasmania; Case number 22/1990) cited in Taitz at 278-280

<sup>324</sup> Unreported judgement of the Supreme Court of New South Wales; Case number 91/10162/89. See generally McLeod at 584-590

<sup>325</sup> See Taitz at 278

respective DNA-fingerprints matched, and in addition, it was argued that the samples from which the DNA-fingerprints were produced were erroneously substituted. There was also a strong presence of the victim's DNA in the vaginal swab sample, where it would not normally be expected. This, combined with the complete absence of the victim's DNA in the victim's blood sample (where it naturally would be expected), was taken by the court as an indication that the samples themselves had been mixed up.<sup>326</sup> Further, the problems with the matching of the bands exhibited in the respective DNA-fingerprints may have been caused by one or more errors in the RFLP methodology.<sup>327</sup>

It would thus appear that, as was the case in *People v Castro*, the quality control of the methodology in producing the DNA-fingerprint in the *Tran* case, was not of an acceptable standard. The court held that to put such evidence before the jury would have a tendency to produce a misleading and confusing impression. The problem of the disputed banding was further exacerbated by the fact that the matching was visually noted and measured with a ruler and not computerised.<sup>328</sup> Finally, the conversion of the findings into a statistical probability was called into question.<sup>329</sup> Although *Tran* was convicted on other evidence, the failure of the DNA-fingerprinting as a forensic identification test clearly indicates that the methodology was not as accurate or reliable as it should have been to be considered proof beyond reasonable doubt.

Up to 1997, the interpretation of DNA evidence had not been considered at any length in the New Zealand Court of Appeal.<sup>330</sup> In South Africa, the use of crime samples as a source of

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<sup>326</sup> McLeod at 585-586

<sup>327</sup> See generally McLeod at 587-588 and Taitz at 279. In the *Tran* case, during the fragmentation stage of the DNA by restrictive enzymes, the possibility exists that natural degradation of the DNA occurred, which broke the vaginal sample into small pieces that defeated the test. During the same stage, if only partial digestion of the DNA took place, some of the cut DNA will be joined to other pieces, creating extra bands on the final DNA-fingerprint. Leakage of extracted DNA into neighbouring wells may have occurred during the electrophoresis stage, leading to contamination. On occasion, the probe in the hybridisation stage binds to DNA sequences other than the specific targeted DNA, causing cross hybridisation, which will produce extra faint bands should the autoradiograph be exposed for too long a period. No testing was done by the laboratory for bacterial contamination of the vaginal samples. Such contamination may have caused some of the disputed banding.

<sup>328</sup> McLeod at 586

<sup>329</sup> Taitz at 279. The accuracy of any statistical probability is highly dependent on an accurate database (see discussion *infra*). In the *Tran* case, the database did not relate solely to Vietnamese, use of which would have reduced the odds of obtaining a random match from 1 in 152 to that of 1 in 87.

<sup>330</sup> B Robertson and T Vignaux 'DNA on Appeal' (1997) *New Zealand Law Journal* 210 at 210. DNA evidence was put to the court in two cases: in *R v Pengelly* [1992] 1 NZLR 545, some interpretational issues regarding

DNA for forensic investigation only began in 1993<sup>331</sup> and 1995 saw DNA evidence being both accepted<sup>332</sup> and rejected<sup>333</sup> in the same year. In South Africa, the Police Forensic Science Laboratory is the primary facility specialising in DNA testing for criminal prosecution purposes.<sup>334</sup>

Before the advent of DNA-fingerprinting, the various blood and tissue tests could only exclude an individual as the culprit. However, through the use of DNA-fingerprinting, positive identification of a particular individual became and remains possible. Initial extravagant claims that an error in DNA-fingerprinting is as low as one in two million cases or one error in thirty billion cases<sup>335</sup> have been shattered.<sup>336</sup>

The standard for admitting novel scientific evidence set forth in *Daubert* may not sufficiently address reliability issues.<sup>337</sup> The guidelines are vague and unhelpful to the courts. Further, the tests and guidelines described require that judges make extremely technical determinations that they may not actually be qualified to make – essentially becoming amateur scientists.<sup>338</sup> The application of *Daubert* to DNA evidence has been questioned; the opinion being that the extremely incriminating nature of the evidence would seem good cause for a higher standard of admissibility.<sup>339</sup> The *Frye* test might avoid many of the problems prevalent when using the *Daubert* criteria by requiring a higher standard of admissibility, while leaving judicial decisions

the way in which the DNA evidence was presented in court were raised, and in *R v Dougherty* [1996] 3 NZLR 351 the argument centred on what should have been mentioned in evidence.

<sup>331</sup> See *S v Smile & another* (supra). The DNA evidence was challenged in this case.

<sup>332</sup> *S v Nondala & another* (Eastern Cape Division CC 20/95 unreported) cited in Goodwin and Meintjies-Van der Walt at 152; *S v Conradie* (Cape Provincial Division CC 98/96 unreported) cited in Mooki at 568.

<sup>333</sup> *S v Motloutsi* (supra)

<sup>334</sup> Goodwin and Meintjies-Van der Walt at 169. Independent laboratories, such as Grootte Schuur Hospital and the Cape Town Medical School facilities, are becoming available for confirmation testing. According to Martin (at 67), in the Cape Province alone, approximately 800 requests for DNA fingerprinting in disputed paternity cases were received by the Western Province Tissue Immunology Department at the University of Cape Town Medical School in 1991. Of their findings, none were placed before the then Cape Provincial Division for consideration. The cases were settled out of court on the basis of the blood tests alone.

<sup>335</sup> See L Böhm and J Taitz 'The DNA-fingerprint: A Revolutionary Forensic Identification Test' (1986) 103 *South African Law Journal* 662 at 668

<sup>336</sup> Taitz at 280-281. In the *Castro* case, the laboratory claimed the probability of a random match error in the relevant community to be as low as one in 100 000 000. However, using the laboratory's own procedure, one of the chief defence witnesses, a Dr Lander, recalculated the chance of error as high as one in seventy eight. Lander then proceeded to show the chance of error in the methodology used by the FBI laboratory as being even higher, namely one in twenty four.

<sup>337</sup> Kramer at 158

<sup>338</sup> Bennett at 172 citing Justice Rehnquist's dissenting opinion in *Daubert* supra

<sup>339</sup> JC Smith, Jr 'The Precarious Implications of DNA profiling' (1994) 55 *University of Pittsburgh Law Review* 865 at 874

to the judge and scientific determinations to the scientists.<sup>340</sup> In *State v Bible*<sup>341</sup> it was stated that *Frye*'s more conservative approach might better counter scientific and statistical evidence, which tends to have an "aura of infallibility". The concerns with statistical probability evidence and the high possibility of errors – human and otherwise – inherent in the typing procedures, may best be addressed by a reliability requirement much like the third prong in *Castro*.<sup>342</sup> This requirement effectively individualises each case and protects defendants from evidence that may have been obtained using faulty laboratory practices.<sup>343</sup>

### 3.1.4 Statistical issues and population genetics in DNA profiling

Because only a tiny portion of the total DNA, from either suspects' or crime scene samples, are compared<sup>344</sup> it is possible for a match to occur by coincidence. A decision must therefore be taken as to the significance of the match, and this is typically done by calculating the probability of the match having occurred by chance. In a criminal trial this figure must be presented to the court, and the court (or the jury) is in charge of the final stage of the interpretation of DNA evidence, namely, assessing the significance of the DNA evidence in the light of all the other evidence against the defendant.<sup>345</sup>

#### 3.1.4.1 Declaring a match

The first stage in the interpretation of DNA profiles is the declaration of a match. This process involves determining whether the positions of the bands on the autoradiograph prepared from the crime scene sample match those of the suspect's sample. This is firstly done using the naked eye, after which it is confirmed by computer-analysed sizing of the fragments.<sup>346</sup> The declaration of a match also requires a decision as to whether, although slight differences in positions of the bands exist, they are still within an acceptable range – the so-called 'match

<sup>340</sup> R Lempert 'Some caveats concerning DNA as Criminal Identification evidence' (1991) 13 *Cordozo Law Review* 303 at 335 states that "when the probative value of evidence turns on the question of the validity of theories, the adequacy of technologies, and the interpretation of data that are on the cutting edge of several modern sciences, scientifically naïve judges are not well equipped to determine by themselves what is, from a scientific standpoint, sufficiently sound to be relied upon."

<sup>341</sup> 858 P2d 1152 (Ariz 1993) at 1183, *cert. denied* 114 S Ct 1578 (1994)

<sup>342</sup> See *People v Castro* (*supra*) for a discussion of the three-pronged test for admissibility of DNA evidence

<sup>343</sup> Bennett at 173

<sup>344</sup> See paragraph 3.1.1 *supra* regarding VNTR loci

<sup>345</sup> Redmayne at 465

window'.<sup>347</sup> If the two profiles that are being compared do not match, then the suspect can be eliminated from the investigation.<sup>348</sup>

A common problem at the matching stage is 'band-shift'. During electrophoresis, two DNA samples, which come from the same source, may move through the gel at different speeds. Typically, this will produce two similar profiles, but the bands in one profile will be slightly higher on the autoradiograph than the bands on the other. In such a situation it may be tempting for the scientist to ignore the discrepancy and declare a match.<sup>349</sup> A more serious problem at the matching stage is the situation where one profile matches the other at several loci, but there are discrepancies in the number of bands between the two profiles. A scientist may decide to interpret some bands as 'artefacts', that is, bands arising due to problems in the preparation of the DNA profile, rather than from genetic differences between the two samples.<sup>350</sup> An example of this occurred in *R v Deen*,<sup>351</sup> where the prosecution scientist claimed that there were ten matching bands between suspect and crime-scene profiles, and this formed the basis of his calculation of match probability. The defence initially argued only eight matching bands but later conceded that stringency<sup>352</sup> could explain one of the discrepancies. There may thus be a considerable amount of human judgement involved in the matching of DNA profiles, and this could mean that a scientist who exercises this judgement might make decisions that are prejudicial to a defendant. A scientist might assume discrepancies could be explained by stringency, degradation or partial restriction<sup>353</sup> as was the case in *Deen*. If these

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<sup>346</sup> Goodwin and Meintjies-Van der Walt at 161

<sup>347</sup> S Rosenthal 'My Brother's Keeper: A Challenge to the Probative value of DNA Fingerprinting' (1995) 23 *American Journal of Criminal Law* 195 at 199. Declaring that there is a band match essentially means that any differences between the distances migrated by purported identical bands are less than a certain percentage of their mean molecular weight. For example, the FBI will declare a match provided the sizes of the two bands differ by no more than 2.5% of their mean molecular weight. Other laboratories use a match window of 1.8% (see Goodwin and Meintjies-Van der Walt at 162). This match window is also called a 'bin' and the method of declaring a match is sometimes referred to as 'match/binning'.

<sup>348</sup> Rosenthal at 199-200. Usually, three to five loci are analysed. If a match is not established at every locus, then the crime sample and the sample from the suspect could not be from the same source and the analysis ends. If, however, all loci do match, the most definite statement that can be made at this point is that the two samples may have come from the same individual.

<sup>349</sup> Redmayne at 466

<sup>350</sup> *Ibid*

<sup>351</sup> *The Times*, 10 January 1994

<sup>352</sup> Stringency refers to the conditions under which preparation of the DNA profile is carried out: too great a degree of stringency may wash off some bands, whereas too little will leave the profile a messy blur. It was the trial judge's failure to point out the significance of the remaining discrepancy between the two profiles, which was one of the reasons why the Court of Appeal ordered a retrial in *Deen* (see Redmayne at 466).

<sup>353</sup> Partial restriction occurs when the enzymes used to cut the DNA (the so-called restriction endonucleases), cut the DNA in too few places.

explanations are used by the prosecution to dismiss discrepancies, and are not picked up by the defence, there is a possibility that they will become closed issues since they will stand uncontradicted. On the other hand, apparent discrepancies between two profiles, which are claimed to match, can considerably decrease the weight of the DNA evidence, when these are pointed out by the defence.<sup>354</sup>

#### 3.1.4.2 Calculating the match probability

Once a match has been declared, the expert must make a decision as to the significance of the match by calculating the match probability. Essentially, this involves calculating the probability of the match having occurred by chance.<sup>355</sup> For this to be calculated the scientist will need some knowledge of the frequency with which the alleles represented on the autoradiograph occur within the population, by making use of population databases. The use of the product rule<sup>356</sup> to calculate match probability has been the subject of intense controversy in the United States. The validity of the product rule is based on two assumptions: firstly, that the calculated probability for the occurrence of each individual allele is correct, and secondly that these calculated probabilities do not depend on each other. For the use of the product rule to be justified when calculating allele frequencies, alleles would have to be distributed evenly around a population.<sup>357</sup> In *People v Castro* (supra) the use of the product rule was criticised, because it ignored the fact that the alleles sampled during DNA profiling might not occur independently of each other.<sup>358</sup> Thus, simply multiplying the assumed frequencies might underestimate the probability of a match. It should also be noted that, even if a database pertains only to a particular ethnic group in a population, such an ethnic group might contain several genetically

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<sup>354</sup> Redmayne at 466

<sup>355</sup> Redmayne at 469

<sup>356</sup> The product rule involves determining the frequency with which each individual allele occurs in the population and then multiplying these probabilities with each other. For example, in *Deen* (supra) it was assumed that each of the alleles in question occur in the population with a frequency of 0.26. To calculate the match probability of ten alleles, one would then multiply 0.26 ten times with itself, giving a probability of 1 in 708 380.

<sup>357</sup> See Rosenthal at 201; Goodwin and Meintjies-Van der Walt at 165-166. The product rule is based on the assumption that the population from which the frequency estimates were drawn was in Hardy-Weinberg equilibrium. This requires three conditions: (1) independent segregation of alleles and no mutations, (2) no selection based on genotype, and (3) random mating. Humans often choose mates on the basis of race, language or religion, and larger populations may actually be composed of smaller genetically diverse subgroups. Mating within these ethnic subgroups could cause the random fixation of certain alleles, making an ethnic subgroup genetically different from the population at large.

<sup>358</sup> Redmayne at 470

distinct sub-groups.<sup>359</sup> Early critics of the statistical assumptions made by DNA profiling agencies suggested that the existence of racial sub-groups could mean, “people may be going to jail because statistical independence has been declared in forensic applications of DNA-fingerprinting, without anyone ever collecting the data required to justify it.”<sup>360</sup>

The population genetics debate may be summed up as follows: on one side are those who argue that it is possible that the alleles sampled by DNA profiling techniques are not independent and may occur with greater frequency within certain populations. Therefore one cannot make assumptions about the occurrence of alleles until further empirical knowledge about the genetic structure of a population is available. On the other side is a more pragmatic group, who argue that the available evidence suggests that the product rule and the frequencies and procedures currently used in forensic DNA profiling are sufficiently conservative. Although there is as yet little evidence of dramatically low rates of allelic variation in populations in the United States and the United Kingdom, it is possible that it could be uncovered through substantial research. Until such research is carried out, some doubt will remain over the figures currently quoted in trials.<sup>361</sup> The DNA typing frequency database established for South Africa falls short of being adequately representative of all ethnic groups within the population. The database was established from so-called ‘convenient samples’ taken from broadly defined races, and lacks frequency estimates for several genotypes in the Asian population.<sup>362</sup> In *S v Motloutsi* the prosecution decided not to lead DNA evidence, since it

<sup>359</sup> For example, in the United Kingdom, the so-called Asian population may contain *inter alia* Pakistani, Kashmiri and Punjabi peoples.

<sup>360</sup> JE Cohen, ‘DNA Fingerprinting: What (Really) are the Odds?’ (1990) 3 *Chance: New Directions for Statistics and Computing* 26 at 26

<sup>361</sup> Redmayne at 471-472. In 1992, a report published in the USA by a Committee of the National Academy of Science’s National Research Council (NRC), on DNA Technology in Forensic Science (*DNA Technology in Forensic Science* 1992, National Academy Press, Washington DC), proposed a ceiling principle which was aimed at providing the most conservative estimates possible, even for a sub-structured population. This principle would retain the product rule, but contain ceiling estimates of allele frequencies, which would represent the maximum for any ethnic heritage in a population. A second report by the NRC in 1996 advocated the use of conditional frequencies rather than profile frequencies. This shifts the emphasis from the chance of finding the test profile in a random person, to the chance of finding a second occurrence of the profile at all. Forensic science favours interpreting evidence in terms of likelihood ratios (see paragraph 3.1.5 *infra*), where the probability of evidence under one explanation, is compared with the probability under another explanation. Originally rejected by the NRC in 1992, the 1996 report strongly endorses the use of likelihood ratios in the interpretation of profiles from more than one stain (see Goodwin and Meintjies-Van der Walt at 166).

<sup>362</sup> Goodwin and Meintjies-Van der Walt at 167. The ‘convenient samples’ were taken from individuals because they happened to be easily obtainable. The races are broadly defined as Asian, Coloured, Black and Caucasian, making no provision for the existence of genotypically different subgroups within these races.

transpired that the state had relied on a database, which was admittedly inadequate in that it could not be used to create a reliable DNA profile of 'Asians'.<sup>363</sup>

There will always remain some doubt as to whether, in a particular case, a match frequency is unjustifiably small, but such fears are perhaps best left to be debated in individual cases where the court can assess them in the light of case-specific factors.<sup>364</sup>

### 3.1.5 The presentation and use of DNA evidence in court

The correct way to present DNA evidence is in the form of a 'likelihood ratio', which expresses how much more probable the evidence is if the accused were the source of a sample, rather than a randomly selected person of the relevant population group.<sup>365</sup> The likelihood ratio is mathematically calculated as follows:<sup>366</sup>

The probability of the evidence (that is, a match) given that the suspect is guilty

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The probability of the evidence given innocence (that is, that the match occurred by chance)

The likelihood ratio is derived from Bayes' theorem<sup>367</sup> which calculates conditional probabilities. Likelihood ratios express the probability of an event in terms of two alternative hypotheses. It is a common assumption that the top half of the likelihood ratio – the numerator – would be one, that is, if the defendant were guilty, the two DNA profiles would be bound to match. However, deficiencies in the process of preparing DNA profiles may mean that two samples from the same source will not produce identical profiles. It would therefore be correct to use a numerator of less than one. This would diminish the power of the likelihood ratio, thereby decreasing the strength of the DNA evidence.<sup>368</sup> Since the *Deen* trial, the Forensic Science Service in the United Kingdom has developed statistical methods, which are designed to deal with some of the problems that occur at the matching stage. The accepted method, in the United Kingdom, for deciding when two bands are in the same position on a DNA profile,

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<sup>363</sup> Mooki at 571, 577

<sup>364</sup> Redmayne at 473

<sup>365</sup> Robertson and Vignaux (1997) at 210

<sup>366</sup> Redmayne at 467.

<sup>367</sup> See *infra*

<sup>368</sup> Redmayne at 467

has been a process called 'match/binning', which involves declaring a match between two bands when they fall within a certain distance of each other, the so-called 'bin' on the autoradiograph.<sup>369</sup> The use of bins with a rigid cut-off point to declare a match was seen as artificial, and the new method that has been developed by the Forensic Science Service, would mean that the match-declaration stage could be side-stepped: instead, a likelihood ratio would be used which would effectively balance the similarities between two profiles against any dissimilarities.<sup>370</sup>

Once the expert has calculated the probability of a match and presented it to the court, in the form of a likelihood ratio, the court then has to interpret the significance of the evidence.<sup>371</sup> The Court in *Deen* explained that there were two questions that have to be considered when dealing with the DNA evidence:

- (1) What was the probability that an individual would match the DNA profile from the crime sample given that he was innocent?
- (2) What was the probability that an individual was innocent, given that he matched the DNA profile from the crime sample?

The prosecutor's fallacy consisted of giving the answer to the first question as the answer to the second.<sup>372</sup>

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<sup>369</sup> See paragraph 3.1.4.1 *supra* on the declaration of a match

<sup>370</sup> Redmayne at 468-469. However, even with more sophisticated statistical analysis, there remains the problem of deciding just when a mark on an autoradiograph should be regarded as a separate band, rather than a part of another band or an artefactual band. The Forensic Science Services, UK attempted to eliminate some of these problems by having the number of bands on the autoradiograph counted three times, by different scientists. The smallest number of bands marked will then taken to be the actual number. Because the new method may produce a large match probability even in cases where there are discrepancies between the two profiles, defence counsel are likely to capitalise on such discrepancies to try and throw doubt on the match probability.

<sup>371</sup> Redmayne at 474. An example of such interpretation occurred in *Deen*, where an appeal was allowed on two relatively narrow grounds: Firstly, the trial judge had failed to draw the jury's attention to the possible significance of one non-matching band on the suspect and crime-scene DNA profiles. Secondly, the court of appeal was persuaded that at various points during the trial, the 'prosecutor's fallacy' had been committed.

<sup>372</sup> Redmayne at 474. Robertson and Vignaux (1995) at 91 states that the prosecutor's fallacy occurs when one transposes the conditional, in that one assumes that  $P(nG|E)$  and  $P(E|nG)$  is the same thing, which it is in fact not. (For an explanation of the notation used, see *infra*).

The strength of DNA evidence is conditioned by the 'prior odds' of the defendant's guilt. Using the odds form of Bayes' theorem, the role of DNA evidence can be depicted in the following manner:<sup>373</sup>

$$\frac{P(G|E)}{P(nG|E)} = \frac{P(G)}{P(nG)} \times \frac{P(E|G)}{P(E|nG)}$$

That is,

$$\text{POSTERIOR ODDS} = \text{PRIOR ODDS} \times \text{LIKELIHOOD RATIO}$$

It is the expert witness' task to present the likelihood ratio (the match probability) to the court. The court's task is then to multiply the likelihood ratio by the prior odds (their assessment of the probability of the defendant's guilt before hearing the DNA evidence). This will then produce the posterior odds: the assessment of the probability that the defendant is guilty, given the DNA evidence plus the other evidence presented during the trial.<sup>374</sup> In cases involving DNA profiling evidence, the likelihood ratio can be extremely large.<sup>375</sup> However, if the prior odds are extremely low, the impact of the DNA evidence will be dramatically reduced. This demonstrates the importance of the court's assessment of the prior odds in DNA cases, or in any case involving probabilistic reasoning. The prior odds should be assessed on the basis of any other evidence against the suspect before the DNA evidence is introduced.<sup>376</sup> In cases where there is no evidence against a suspect apart from DNA evidence, the prior odds (which cannot be zero), must be based on a 'suspect population', that is, the number of people who could have committed the offence.<sup>377</sup> The important point is that the assessment of prior odds is the court's (or the jury's) task. Prior odds will depend on information about the perpetrator and the defendant, rather than on the DNA evidence. Thus, it is possible for the impact of DNA evidence to be conditioned by the testimony of a single eyewitness.

<sup>373</sup> DJ Balding and P Donnelly 'The prosecutor's Fallacy and DNA Evidence' (1994) *Criminal Law Review* 711 at 716-719. Notation: P = probability; G = guilty; nG = innocent; E = evidence (that is, the DNA evidence). The symbol | means 'given', thus P(G|E) can be read as 'the probability that the defendant is guilty given the evidence'.

<sup>374</sup> Redmayne at 474-475

<sup>375</sup> See the discussion in paragraph 3.1.4 (supra) on using the product rule to determine the denominator portion of the likelihood ratio, that is, the probability of a random match.

<sup>376</sup> Redmayne at 475. If DNA evidence is introduced before the other evidence, Bayesian analysis demands that each new piece of evidence forms a likelihood ratio, which is multiplied by the new prior odds.

Information about the suspect population will be crucial in the determination of the prior odds. A forensic science agency will usually keep separate databases for all the major races. For certain sub-populations within these broad racial designations, the occurrence of a higher allele frequency and non-independence of alleles, will prejudice defendants who happen to be from these sub-populations.<sup>378</sup> A contrary argument to using sub-population databases is the following: The denominator of the likelihood ratio is  $P(E | nG)$ , that is, the probability of the DNA match given that the defendant is not guilty. But if the suspect is innocent, there is no reason to believe that the person who actually left the DNA at the scene of the crime comes from the same racial sub-group as the subject. Using only the suspect population as a database in such a case to determine the probability of a random match, will thus place a narrow constraint on the population of the culprit.<sup>379</sup> However, in some cases the suspect's ethnic sub-group may quite obviously be relevant. In the United States where DNA evidence has been adduced in cases where a crime has been committed among the members of a racial sub-group, such as in a Native American reservation, a Native American database was used to calculate a match probability.<sup>380</sup>

If it is appropriate to use specific databases in certain cases, the question arises how often it should happen. It will be appropriate in any case where it is possible that suspect and perpetrator are both members of a particular ethnic group. Also, when other evidence suggests that a perpetrator comes from a certain racial group, even when the wrong person is arrested, it is likely that he will belong to the same distinct sub-population as the actual perpetrator.<sup>381</sup> Another factor which can have a sizeable impact on the DNA evidence, is the possibility that a close relative of the defendant committed the crime. In such a case, a likelihood ratio of thousands or tens of thousands may be reduced to one of less than four.<sup>382</sup>

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<sup>377</sup> Redmayne at 476. In many cases involving DNA evidence there will be some evidence about the perpetrator, which will allow the prior odds to be assessed more accurately than a simple area-population figure. For example, the perpetrator's sex, race and approximate age may be known from eyewitness descriptions, indicating the suspect population.

<sup>378</sup> See the discussion in paragraph 3.1.4.2 supra.

<sup>379</sup> Redmayne at 477

<sup>380</sup> *United States v Two Bulls* 925 F2d 1127 (1991). See however, DH Kaye 'Comment: Uncertainty in DNA profile evidence' (1991) 6 *Statistical Science* 196 who states (at 197) that the assumption that the Native American population is homogeneous enough to justify a single general database is questionable.

<sup>381</sup> Redmayne at 478

<sup>382</sup> See Rosenthal at 210-213. Parents and children share one identical allele at every locus. Siblings, on average, share one allele per locus; that is, siblings have a 25% chance of inheriting the same pair of alleles

There thus seems to be three main stages at which doubt may arise regarding the significance of DNA profiling evidence: (1) the procedure used by the laboratory to prepare the DNA profile and declare a match; (2) the statistical techniques used to declare a match probability; and (3) the combination of the match probability with the prior odds. For the fact-finder in a criminal trial that involves DNA evidence, the crucial question is whether such doubt amounts to reasonable doubt and thus justifies an acquittal. The use of probabilistic methods in the interpretation of DNA evidence involves the danger that doubts which favour the defendant will be ignored at various stages in the presentation and preparation of evidence, or that a subtle shift in the burden of proof will take place.<sup>383</sup>

## 3.2 Fingerprint evidence

### 3.2.1 Nature, detection and visualisation of fingerprints

Dactylography – the science of fingerprint examination – is based on the premise that fingerprints are unique, unchanging, and capable of being transferred to various surfaces. Although the term ‘fingerprint’ is most often used to describe this field of forensic science, many other impressions, including those created by palms, feet, toes, shoes and tires are used by forensic scientists to identify individuals.<sup>384</sup> No two fingers have yet been found that share identical characteristics. The identifiable aspects of a fingerprint are called minutiae (or ridge characteristics). The shape, location, and number of minutiae individualise a fingerprint.<sup>385</sup> These ridge characteristics (also called friction ridges) are found on the palmar surface of the hands and fingers. The friction ridges and the pattern they make will remain the same, although they will expand during the growing stages of life and shrink as the body ages. The pattern is resilient and constant and even though it may temporarily be interrupted if the epidermis is scarred, once the scar heals, the original pattern will return.<sup>386</sup> Each pattern is

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from their parents. The ‘it was my sibling’ defence came up in the case of *State v Nielsen* 467 NW 2d 615 (Minn 1991). In that case, the defendant was convicted of first-degree murder. Semen found on the victim’s body could have come from the defendant or his brother, since they both had type A semen. However, DNA testing quickly eliminated the brother as a source of the crime scene sample.

<sup>383</sup> Redmayne at 464

<sup>384</sup> JA Tarantino *Strategic Use of Scientific Evidence* (1988) at 50-51

<sup>385</sup> RF Becker *Scientific Evidence and Expert Testimony Handbook* (1997) at 26

<sup>386</sup> Tarantino at 51. Each person’s body has a particular friction ridge pattern that originates during foetal development. Two layers of friction skin, the epidermis and the dermis, contain furrows or grooves. Between these grooves are the friction ridges.

unique, and the odds of any reproduction or duplication of fingerprints is said to be one in sixty four billion.<sup>387</sup> While each pattern is unique, there are three common types of patterns in which fingerprints are systematised and classified: loops, arches and whorls.<sup>388</sup> Fingerprints are important because the unique characteristics they possess are capable of being transferred from the friction skin to other surfaces. Sweat glands in the dermis discharge perspiration through pore openings located at irregular intervals on the ridges. The discharge is then deposited on surfaces through contact with friction skin. This deposit consists mainly of water containing sodium chloride, amino acids, and a variety of other organic and inorganic substances. The above, together with trace materials such as dead epidermal cells and various foreign substances, leaves a latent impression of the friction skin on the surface contacted.<sup>389</sup> This impression can be characterised as visible, invisible, or plastic.<sup>390</sup>

The detection of fingerprint impressions is usually done at the crime scene. Because some prints are visible to the naked eye, the first phase of any search is a visual one, where the investigator looks for both visible and plastic impressions.<sup>391</sup> Once this is done, the investigator will look for invisible impressions. A number of chemical and powder techniques may be used to locate and visualise these invisible impressions. The type of surface being searched for impressions determines the visualisation procedure.<sup>392</sup> One of the most difficult

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<sup>387</sup> M Braun 'Quantitative Analysis and the Law: Probability theory as a tool of evidence in Criminal Trials' (1981) *Utah Law Review* 41 at 57

<sup>388</sup> Tarantino at 51-52. Loops account for between 60-70% of all fingerprint patterns. Each loop has a delta – the point on the ridge nearest to the centre of divergence of the innermost lines of the loop; a recurve – which is a backward or inward curve; and a ridge count – the number of ridges between the pattern's delta and the core or centre of the fingerprint pattern. Arches are relatively uncommon, representing only 5% of all fingerprint patterns, and are classified as either plain or tented. Approximately 25-35% of all fingerprint patterns are whorls. Whorls are characterised by a circuitous pattern, with at least two deltas and a recurve.

<sup>389</sup> J Nickell and JF Fischer *Crime Science: Methods of Forensic Detection* (1999) 131.

<sup>390</sup> Tarantino at 52. Plastic impressions occur when the latent impression of the friction skin is left on a soft surface, such as wax, putty or butter.

<sup>391</sup> Becker at 30-31

<sup>392</sup> Tarantino at 53-55. Generally surfaces are classified as either porous or non-porous. Porous surfaces, such as paper, cardboard and unfinished wood, must be treated with a chemical technique to enhance visualisation. The most common techniques involve the use of ninhydrin (or more recently diazafluorenone as a substitute for ninhydrin), silver nitrate or iodine fuming. The most successful visualisation technique for nonporous surfaces, such as glass, metal, and finished wood, involves the application of fingerprint powder. When applied to an area containing a latent impression, the powder adheres to the residue. The investigator either spreads the powder over the area with a special fingerprint brush or sprays magnetised powder over the area and collects the excess with a magnet. The most common type of fingerprint powders are gold bronze, grey and red bronze, aluminium, and black. The type of powder used in each instance depends on the nature and colour of the surface. The fingerprint investigator chooses the powder that is likely to produce the sharpest contrast with the surface. Some experimental and novel methods of fingerprint visualisation include laser illumination, autoradiography, metal deposition and 'Super Glue' (cyanoacrylate) fuming. Since 1978, the FBI has used

surfaces for the detection of fingerprints is the human skin. The fingerprint residue and human skin generally contain the same chemicals, making it difficult to develop any contrast between them. In addition, fingerprint residues quickly disperse once deposited on the skin, resulting in blurring of the ridge pattern detail. Although difficult, it is not impossible to obtain prints from human skin.<sup>393</sup> The fingerprint impression must also be recorded so that it will be able to be used at a trial. A permanent record of the fingerprint is achieved by photography and lifting.<sup>394</sup> The print can be photographed after visualisation with specially designed cameras. The print is developed either by reversing the negative or by using direct duplicating film. Because the method used to visualise the print may be volatile and cause the impression to fade quickly, the photograph must be taken immediately after visualisation.<sup>395</sup> After the print has been photographed, a lift, either opaque or transparent, is used to make a second permanent record of the impression.<sup>396</sup> To make inked impressions of a suspect's fingerprints, each of the suspect's fingers are inked, with pressure applied, and then the fingertip is rolled from side to side on the card or paper on which the fingerprint is recorded. To classify and file fingerprints, the FBI for example, uses Henry's classification scheme.<sup>397</sup> The Henry classification system (and certain sub-secondary extended classifications used by the FBI) is based on patterns of ten fingers. In many cases, the latent impressions obtained will include fewer than ten fingers. In such a case, these classifications must be replaced with a system that includes the depositories of inked impressions for five-finger or single-finger impressions. One of the most common substitute systems is the Battley single print system.<sup>398</sup>

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laser technology to detect latent impressions, and in addition certain high intensity light sources known as 'forensic light sources' are commonly used at present. Ultraviolet rays are also sometimes used to reveal latent impressions (see Nickell and Fischer at 131).

<sup>393</sup> See Nickell and Fischer at 135. The most effective procedure seems to be cyanoacrylate fuming, followed by the application of magnetic fingerprint powder.

<sup>394</sup> Becker at 33

<sup>395</sup> Tarantino at 58

<sup>396</sup> Tarantino at 59. See also Becker at 33. Opaque lifts are used for lifting impressions from uneven or curved surfaces. The most common opaque lift is rubber tape with an adhesive surface and a sheet of protective plastic. The plastic cover is peeled from the tape and the tape's adhesive side is applied to the impression. The tape is then peeled from the surface and the protective plastic cover is replaced. Data available by which the print can be identified is written on the back of the tape. When transparent tape is used to lift an impression, the tape is immediately mounted on a card stock. The advantage of transparent lifting is the ability to instantaneously compare the lifted print with an inked fingerprint.

<sup>397</sup> Tarantino at 60-63. Under this scheme, a symbol indicating the fingerprint pattern type (that is, arch, loop or whorl) is placed under each inked fingerprint impression. The fingerprints are then further classified according to six categories of classification, namely, key classification, major division classification, primary classification, secondary classification, sub-secondary classification and final classification.

<sup>398</sup> Tarantino at 64. In this system, the distance between the core and the delta (the point in a loop where two ridges diverge) is measured and the print is given a letter value between A and H based on this distance.

### 3.2.2 The identification of fingerprints

The identification of fingerprints is a distinctly different task from classification.<sup>399</sup> In most police departments, these tasks are performed by two separate groups of people.<sup>400</sup> The most common method for the identification of fingerprints is manual comparison<sup>401</sup> using a 4X magnifier or a five to ten power magnifying glass to compare the latent and the inked impressions manually.<sup>402</sup> Only if sufficient points of similarity exist between the two impressions can an opinion be rendered that the impressions were made by the same individual. In the manual comparison of prints, the examiner analyses the general pattern as well as the fine ridge detail, including ridge endings, short ridges, bifurcations, dots, islands and enclosures. The first step in a manual comparison is to determine whether the general patterns of the latent and inked impressions match. The analyst should be convinced that general pattern agreement exists, before proceeding on to further analysis. If a general pattern agreement is found to exist, the prints are compared for qualitative agreement. Qualitative agreement occurs when the individual ridge characteristics of the latent print are of the same type and shape as the individual ridge characteristics of the inked impression. If both general pattern agreement and qualitative agreement is apparent, the third step is to make a comparison of the relationship between the details on each impression. There are two common methods used to make this comparison:<sup>403</sup> Firstly, one impression can be superimposed onto the other. This can sometimes be misleading, since, even if the impressions were made by the same person, a distortion in pressure, or twisting which occurred during the making of the latent or inked impressions may cause the impressions to superimpose incorrectly. In the second method, an attempt is made to draw geometric designs that connect the various ridge details. The examiner will then determine whether a similar design connects each corresponding detail on each impression. The fourth step, is the quantitative determination, whereby the number of points of identity shared by the two impressions is determined.

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<sup>399</sup> See Nickell and Fischer at 125. These authors state that ideally one should speak of *identifying* a mark as a fingerprint, and the process of determining that a fingerprint belongs to a particular person, should be referred to as *individualising* the fingerprint.

<sup>400</sup> Tarantino at 64

<sup>401</sup> Manual comparison sometimes follows an initial search of the fingerprint data-base by means of computer - see the discussion regarding computer assisted comparisons in paragraph 3.2.4 *infra*.

### 3.2.3 Admissibility of fingerprint evidence

Quite frequently, the only substantial evidence that links an accused with the scene of the crime is fingerprint evidence. Evidence of this kind is usually produced by the state in the following way:<sup>404</sup> (a) the prints at the scene of the crime are lifted; (b) a set of the accused's prints is taken; (c) the two sets of prints in (a) and (b) are enlarged, set side by side, and compared by an expert on points of similarity; (d) in addition, the expert may take a set of the accused's prints and compare this set with the prints from the scene of the crime to verify his opinion. The expert is then called by the state to give evidence on the issue of similarity of the prints. Even if similarity cannot be clearly demonstrated to the court, the issue is not whether the court can see the similarities or dissimilarities indicated by the expert, but whether the court can trust and rely on the opinion of the expert whose expertise must be established in the normal fashion.<sup>405</sup> The evidence of comparison may be given orally or by affidavit.<sup>406</sup> It must be established exactly which prints are being compared with which; otherwise the expert's opinion is valueless. This would ideally entail that the state calls the policeman or technician who lifted the prints at the scene of the crime (a), and then calls the policeman who took the accused's prints (b).<sup>407</sup>

There has been some dispute as to the manner of proving fingerprint comparisons. In *S v Segai*<sup>408</sup> the only evidence linking the accused to a housebreaking, was the evidence of fingerprint expert who lifted a set of prints (a) from the scene of the offence and later compared them with fingerprints taken from the accused (b). Another policeman, who was not called as a witness by the prosecution, had recorded the latter set of prints. The expert made a photographic enlargement of the two sets of prints (c), which showed ten points of similarity. As a precaution, the expert took the accused's fingerprints (d) just before the trial and compared them with those recorded by the policeman (b). No comparative enlargement of

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<sup>402</sup> Tarantino at 65. The latent impression is examined first. These results are then compared with the results of an inked impression. Use can also be made of a comparator, whereby the latent and inked impressions are placed side by side on a screen for comparison.

<sup>403</sup> See Tarantino at 65-67

<sup>404</sup> See D Unterhalter 'Expert Evidence' (1988) *Annual Survey of South African Law* 453

<sup>405</sup> A Skeen 'Fingerprint evidence' (1988) 1 *South African Journal of Criminal Justice* 339 at 340. See also *S v Malindi* 1983 (4) SA 99 (T) at 104C-D

<sup>406</sup> See sections 212(4) (discussed supra) and 212(6) of the Criminal Procedure Act 51 of 1977

<sup>407</sup> Unterhalter at 453

<sup>408</sup> 1981 (4) SA 906 (O)

prints (a) and (d) were placed before the court. The court, on review, held<sup>409</sup> that this procedure was unsatisfactory because the absence of a comparative chart relating to (a) and (d) put the court in a position where it was unable to adjudicate on the expert's evidence in relation to (a) and (d). An identical factual situation occurred in *S v Van Wyk*<sup>410</sup> where the expert came to the conclusion that all three sets of print (a, b and d) were identical. This evidence was not questioned by the accused. It was held on review that it was totally unnecessary to insist on a comparative chart in respect of (a) and (d).<sup>411</sup> In *S v Phetshwa*<sup>412</sup> it was also held that a failure to produce a second comparative chart was not unsatisfactory and the court was unable to agree with the approach adopted in the *Segai* case. In *S v Malindi*<sup>413</sup> it was not necessary to deal with correctness of *Segai*, but Le Roux J expressed the view<sup>414</sup> that "this court would also in all probability not be prepared to follow the *Segai* decision." The admissibility and value of an expert's opinion in these circumstances was considered in *S v Nyate*<sup>415</sup> the facts being quite similar to those in the *Segai* case. In *Nyate*, the expert gave evidence that there were ten points of similarity between the prints taken at the scene of the crime (a) and those taken from the accused (b). Although the policeman who took the prints in (b) was not called by the state, the expert testified without supporting reasons, that the prints in (b) were identical to the prints he had obtained in (d). The full bench of the Orange Free State Provincial Division found that the expert's opinion as to the identity of (b) and (d) was admissible without any basis of his opinion being given.<sup>416</sup> Following *R v Smit*<sup>417</sup> the court in *Nyate* held that it must be *prima facie* accepted that the expert has done what is necessary to reach his conclusion. The court found that in the absence of any doubts being cast upon the expert testimony - and especially given the probative value of the comparison made by the expert between the prints in (a) and (b) - there was no reason to depart from the magistrate's finding that the fingerprints found at the scene of the crime were those of the accused.<sup>418</sup> The court also emphasised that the problem would have been avoided if the person who recorded

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<sup>409</sup> At 910

<sup>410</sup> 1982 (2) SA 148 (NC)

<sup>411</sup> See *Skeen* at 340

<sup>412</sup> 1982 (3) SA 404 (E)

<sup>413</sup> 1983 (4) SA 99 (T)

<sup>414</sup> At 101D

<sup>415</sup> 1988 (2) SA 211 (O)

<sup>416</sup> See *Unterhalter* at 453

<sup>417</sup> 1952 (3) SA 447 (A) at 452

<sup>418</sup> *S v Nyate* at 216F-J

the fingerprints (b) had given evidence.<sup>419</sup> Thus, *Nyate* must now be considered the prevailing position. Logically, if *a* equals (or is the same as) *b*, and *d* equals *b*; then it follows that *d* equals *a*. Unterhalter<sup>420</sup> is of the opinion that recourse to the process of proof adopted by the state in *Nyate* is not advisable, because it requires the expert to make two sets of comparisons (that is, that  $a = b$  and  $d = b$ ), unnecessarily lengthens the chain of proof, and increases the chance of error. The proper role of the expert is to provide the court with a basis for making an independent judgement. Since in the *Nyate* case it was the state that had failed to provide the simplest proof of the accused's prints, it should not be permitted a short cut by allowing an unreasoned conclusion as to the identity of the prints in (b) and (d) to be admitted.<sup>421</sup> Skeen<sup>422</sup> however, is of the opinion, that in the context of fingerprint evidence, although there are certain cases where expert opinion unaccompanied by additional evidence is virtually valueless, the decision in *Nyate* is in practice quite sensible. In that particular case, the expert highlighted and explained at least ten points of similarity, and thus gave reasons for his conclusions on at least one aspect of fingerprint identification. The court should thus be in a position to decide whether it could trust and rely on the opinion of the expert, without having to see for itself the similarities and dissimilarities. In the absence of any challenge by the accused, the unmotivated opinion of the expert in this instance should be *prima facie* proof that he carried out the requisite tests.<sup>423</sup>

Another possible way of proving the recording of the original set of the accused's fingerprints is by producing the statement of the witness<sup>424</sup> by consent in terms of section 213 of the Criminal Procedure Act<sup>425</sup> together with the fingerprint record. It would also be possible for

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<sup>419</sup> At 217G

<sup>420</sup> At 454

<sup>421</sup> Unterhalter states further (at 454) that, when a witness is accepted as an expert, the courts too often require that one must *prima facie* respect the expert's opinion as being reasoned and not conjecture. The author submits that courts should however not accord such presumptive credence to expert opinion, but should require experts to provide reasons for their conclusions and criteria for testing the accuracy of these conclusions.

<sup>422</sup> Op cit at 341

<sup>423</sup> The court in *Nyate* (at 216F-217C), used similar reasoning to that in *S v Williams* 1985 (1) SA 750 (C), where it was held that where an expert witness draws an inference based on the results of his tests, then the evidence of that inference is admissible and constitutes *prima facie* proof, even if the facts from which he drew the inference are not mentioned. If this *prima facie* evidence is not contested, the court is entitled to rely on it.

<sup>424</sup> In this case the policeman who took the fingerprints in (b)

<sup>425</sup> Act 51 of 1977. This Act also makes provision (in section 212(6)) for the furnishing of *prima facie* proof by means of an affidavit, regarding any finding of or action taken in connection with any particular fingerprint or palm-print.

an accused to make a formal admission in terms of section 220 of the Criminal Procedure Act that the fingerprints (b) are his and that they were recorded by a particular person.<sup>426</sup>

The purpose for which fingerprint evidence is offered may affect its admissibility. If the fingerprints were merely being offered as means of corroboration, a lesser standard of proof would be required for its admission than if they were being submitted substantively to identify the perpetrator of the crime.<sup>427</sup> In cases where the fingerprint evidence is the only evidence against the defendant, there may be some question as to whether such evidence is sufficient to sustain the prosecutor's burden of proceeding. Most courts in the United States require that every reasonable hypothesis, other than that the defendant impressed his fingers at the scene during the crime, must be ruled out before the fingerprint evidence can satisfy the prosecution's burden.<sup>428</sup>

The number of points of similarity necessary for identification is a subject of much debate. There is no generally accepted numerical standard, and the science of fingerprint identification is thus in many ways dependent on the evaluative capabilities of the examiner.<sup>429</sup> It is important not only to know how many points of similarity are found, but also which characteristics are more commonly found in fingerprints and which are uncommon. If there are relatively few points of similarity, and the characteristics are common, it is more likely that the impressions came from different individuals. However, if there are relatively few points of similarity, and the characteristics are extremely rare, it is more likely that they came from the same individual.<sup>430</sup>

In South Africa, seven points of similarity were previously considered sufficient to prove beyond reasonable doubt that the prints were made by one and the same person.<sup>431</sup> In *S v*

<sup>426</sup> Skeen at 342

<sup>427</sup> Tarantino at 75, citing *People v Manson* 61 Cal App 3d 102, Cal Rptr 265 (1976)

<sup>428</sup> See *Jackson v Virginia* 443 US 307, 99 S Ct 2781, 61 L Ed 2d 560 (1979); *Colvin v State* 299 Md 88, 472 A 2d 953 (1984) cited in Tarantino at 75. If the fingerprint evidence is the only evidence against the defendant, the court must be convinced that the fingerprint evidence, in light of the surrounding facts and circumstances, is sufficient to permit a rational trier of fact to find the guilt of the defendant beyond reasonable doubt.

<sup>429</sup> Tarantino at 66. Different police departments in the United States have different requirements for identification. Although some require 8 or 10 points of similarity, most require 12.

<sup>430</sup> See generally DA Stoney and JI Thornton 'A Critical Analysis of Quantitative Fingerprint Individuality models' (1986) 31 *Journal of Forensic Science* 1187

<sup>431</sup> Skeen at 339. See also *S v Kimimbi* 1963 (3) SA 250 (C); and *S v Nala* 1965 (4) SA 360 (A)

*Nala*<sup>432</sup> Wessels JA observed that a fingerprint expert had explained that "...where comparison revealed seven point of correspondence, the identity of the disputed fingerprint was positively established. In such a case the existence of dissimilarities could not affect the identity of the disputed fingerprint, and would be explained upon some other basis, such as "...distortion through movement of the finger... the presence of minute particles of dirt, etc. ...". However, in the case of *S v Sebastian*<sup>433</sup> the expert witness<sup>434</sup> commenting on the so-called 'accepted, current practice' as described in *Nala*'s case, stated that an identification is not considered as such, if even only one unexplained point of dissimilarity exists. He further described the practice that exists in South Africa, of not even looking further for points of dissimilarity, once seven points of similarity are found, as very irresponsible.

Sometimes, dissimilarity between latent and inked impressions can be explained. For example, the inked impression may have been improperly or carelessly made; there may have been uneven pressure which resulted in distortion or blurring; the surface may have been dirty, or the skin may have been dirty or contaminated. In the United States, the practice is that, even if only one unexplained point of dissimilarity exists, the examiner should conclude that the impressions came from different individuals.<sup>435</sup> This is in stark contrast with the situation in South Africa. In *S v Malindi* (supra) it was stated<sup>436</sup> that the court in *S v Nala* (supra) was clearly referring to explicable dissimilarities (and not to inexplicable dissimilarities which would make the identification unacceptable and which would invalidate any comparison between the two points). The court held that it is not necessary to meticulously examine both the similarities and dissimilarities, because if there are sufficient points of similarity, the apparent dissimilarities are unimportant.<sup>437</sup> The court in *Malindi* held further that it is only unexplained dissimilarities that are of importance in the identification process, since police experts are of the opinion that they are able to see when a print, or a certain feature in a print, has been contaminated by dirt or dust or otherwise, and they therefore ignore any doubtful points of

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<sup>432</sup> Supra at 361H

<sup>433</sup> 28 March 1979 Case No 41/1336/798 (Regional Court) cited in JMP Sherratt 'Fingerprint identification evidence: Some observations' (1994) 7 *South African Journal of Criminal Justice* 228

<sup>434</sup> The then captain Jacobus Breedt (now retired commanding officer of the fingerprint office of the South African Criminal Bureau in Johannesburg) – see Sherratt at 228

<sup>435</sup> Tarantino at 67. The International Association of Identification requires that a certified fingerprint analyst render an opinion only if he is relatively certain of his conclusions. Only three opinions are permissible: match, no match, or inconclusive result. Certified fingerprint analysts may not testify as to any probable, possible or likely identifications (Resolution VII).

<sup>436</sup> At 106F

dissimilarity.<sup>438</sup> According to Sherratt<sup>439</sup> in the *Nala* decision the Appellate Division validated an incorrect method of discerning real from apparent points of identity. The author is of the opinion that the decision bases itself in a speculation that “features present in a print automatically assume a nature favourably explicable to the prosecution in the presence of a predetermined number of features being adjudged similar”. This method eliminates from calculation, and hence from examination, all points disagreeing with a presumption of a certain identification. Sherratt submits<sup>440</sup> that this is an illogical argument, if one considers that any one of the apparent dissimilarities, if in fact real, will have the power to invalidate the identification entirely.<sup>441</sup> In a scene of the crime print, the first question posed is whether a mark present is actually representative of any fingerprint, and if so, to what degree. The possibility of confusing a fingerprint ridge characteristic with a variety of other contaminants is very real, and to know which part of the mark is, in fact, a fingerprint requires the application of certain standards of proof.<sup>442</sup> A suitable margin of safety beyond which the fingerprint system is known to have failed is called for.

As the fingerprint system is known to break down at six or seven points of similarity in respect of inked fingerprint comparisons, the idea is not to set the ‘standard’ at the breaking point of the system, but rather some distance from it.<sup>443</sup> The French set the standard at seventeen points of similarity, the English at sixteen. Sherratt submits<sup>444</sup> that seven points is too low a standard to guard against a grave miscarriage of justice, which could easily occur, when the safety standard is equivalent to the breaking strain. The author is of the opinion that the Appellate Division has indicated in *Manqidi and Ndele v the State*<sup>445</sup> that it may well adopt a different approach to the logic expressed in the *Nala* case regarding fingerprint evidence.

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<sup>437</sup> *S v Malindi* at 105A-B

<sup>438</sup> At 105H

<sup>439</sup> *Op cit* at 230

<sup>440</sup> At 230

<sup>441</sup> It should be noted that all points of similarity are initially merely apparent and are properly declared and dealt with as real, only after they are established by further examination to bear the identifiable configuration and characteristics of fingerprint identification features. Sherratt states (at 230) that, “It does not seem right to determine the absence of dissimilarities through the arbitrary application of speculative and presumptive logic.”

<sup>442</sup> Sherratt at 231. He considers that the method of rationalising exactly which parts of a given crime-scene mark constitute fingerprint ridge characteristics, as has been practised in South Africa, is not sound and could result in features of non-fingerprint origin being tallied as similarities in the identification process.

<sup>443</sup> Sherratt at 232. This, not so much to cater for the freak occurrences of different fingerprints with high degrees of correspondence between their ridge characteristics, than to counter the dangers inherent in the evaluation of scene of crime marks of poor quality.

<sup>444</sup> At 231

<sup>445</sup> Case No 176/92 + 638/92 (AD); judgement given 2 September 1993 (discussed in Sherratt at 232-233)

Responding to the criticisms of Jennet J in the case of *S v Manqidi*<sup>446</sup> Milne JA, with Hefer JA and Kumleben JA concurring, gave the following judgement:<sup>447</sup>

“The main criticism [by an expert witness in the trial court] of the evidence identifying the thumb-print... as that of the second appellant were based on the following prepositions:

- (a) that the purely numerative approach adopted by the police fingerprint experts in South African courts was unsound;
- (b) that even if the numerative approach were to be adopted, seven points of identity were now generally speaking internationally regarded as insufficient;
- (c) that whatever the significance of the points of similarity between the disputed fingerprint and the known genuine thumb-print might be, this was cast in doubt because of the presence of a substantial number of dissimilarities;
- (d) that the basis on which the State witness sought to explain the dissimilarities, namely, the presence of dirt, etc. either on the thumb of the suspect or on the surface on which the print was found or movement when the print was placed, could also account for the similarities.”

The Appellate Court held that there was, on the face of it, some substance in these criticisms. However, the Court pointed out that the trial court was of the opinion that the expert witness in this case, while knowledgeable on the subject of fingerprint comparison, did not have the experience or training that a police expert would have. Further, the expert witness had conceded in cross-examination that there were thirteen points of similarity between the questioned print and the undisputed print; and that the dissimilarities might be explicable on the basis given by the police fingerprint expert. The Appellate Court found it unnecessary to come to any firm conclusion on the matter, because even if the thumb-print was not proved to be that of the appellant, there was sufficient other evidence to implicate him in the crime.

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<sup>446</sup> Case No CC32/91 (ECD)

<sup>447</sup> See Sherratt at 233. Jennet J, in the trial court judgement, had conceded that the doubts of the expert witness, regarding the identity of the two fingerprints, were based on the points of dissimilarity which the witness considered inexplicable other than by way of speculation. That court held, however, that is exactly what the difference is between a dissimilarity that is explicable, and one that is inexplicable. For the one, the court held, and explanation can be given, for the other not. The trial court was satisfied that on the police witness' evidence the dissimilarities were explicable.

### 3.2.4 Computer assisted comparisons of fingerprints

Since 1970 many police agencies in the United States and the FBI began using computers to search fingerprint files for inked impressions and to attempt to match inked impressions with latent impressions.<sup>448</sup> Because there is substantial likelihood of distortion in latent prints – due to *inter alia* uneven pressure and contaminated surfaces – the computers may have difficulty in compensating for any expected degree of difference between latent and inked impressions. For this reason, the computer is more likely to reach a false negative conclusion in searching for a perfect match than an individual, who may be able to explain points of dissimilarity.<sup>449</sup>

Finger imaging<sup>450</sup> is the process of using computer equipment to scan fingerprint impressions and to extract identifiable characteristics.<sup>451</sup> This is done in sufficient detail to enable the computer to distinguish a single fingerprint from images of thousands, or even millions, of fingerprints that have been stored in the computer's memory through the automated process. The computer has the ability to scan and digitally encode fingerprints so that they can be subject to high-speed computer processing. The computer's scanning and mapping algorithms convert the spatial relationship of a fingerprint's minutiae points (that is, ridge ending and bifurcations), as well as the ridge direction and ridge contour information into a digitally recorded geometric representation of the fingerprint.<sup>452</sup> Before conducting the search, the technician may enhance the prints to include cuts or breaks in the ridges caused by scars or burns. The computer does not actually compare one fingerprint against another, but rather conducts a mathematical search.<sup>453</sup> Several classification schemes are being developed for computer use. In the digital wording system, for example, the computer searches for specified characteristics in both the latent and inked impressions. The results are put in digital form and when the comparison satisfies certain statistical rules (for example, twenty variables in each impression), the computer reports a match by converting the measurements into a digital code

<sup>448</sup> Nickell and Fischer at 124

<sup>449</sup> See WD Seufert and RA Côte 'Automated Identification and Analysis of Fingerprints by Interferometry' (1984) 29 *Journal of Forensic Science* 486

<sup>450</sup> Also known as automated fingerprint identification systems (AFIS); see Nickell and Fischer at 124

<sup>451</sup> See JK Constance 'Automated Fingerprint Identification Systems: Issues and Options surrounding their use to prevent Welfare Fraud' (1995) 59 *Albany Law Review* 399 at 401 citing TF Wilson and PL Woodard *US Department of Justice, Automated Fingerprinting Systems: Technology and Policy Issues* (1987) at 5

<sup>452</sup> Wilson and Woodard state (at 5) that, "In a ten-print to ten-print search on good quality rolled impressions, the computer plots the spatial relationship of 90 or more minutiae points for each finger, a number to establish the uniqueness of that print from all others." See also Nickell and Fisher at 124.

for each impression.<sup>454</sup> The computer's search algorithm converts the data extracted by the scanner into a binary code which is then used to search the computer's files.<sup>455</sup> The computer uses a scoring system that assigns prints to each of the criteria set by an operator. When the search is complete the computer produces a list of file prints that have the closest correlation to the search prints. All of the selected prints are then examined by a trained fingerprint expert, who will make the final verification on the print's identity.<sup>456</sup> Thus, even when the prints are matched by computer, it is still necessary for the testimony of a human fingerprint examiner to be offered in order to relate the computer results, the final comparison and the identification. Such evidence is vulnerable to objection on two levels: both the live testimony of the fingerprint expert, as well as the computer identification report must comply with the jurisdictional rules on admissibility of scientific evidence.<sup>457</sup>

The finger imaging process has been used in the United States of America as a way to prevent welfare fraud, in cases where individuals go to various offices of the department of Social Services and fraudulently misidentify themselves in order to obtain welfare payments.<sup>458</sup> Besides the issues dealing with an individual's constitutional right to privacy and due process, there is also the fear that the computer may make a mistake, and that individuals who need benefits will be unjustifiably cut off.<sup>459</sup> In New Orleans, for example, a mother on welfare was unjustifiably arrested and detained for eighteen hours, based on an inaccurate crime report which resulted from programming errors in the police computers.<sup>460</sup>

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<sup>453</sup> Constance at 401

<sup>454</sup> Seufert and Côte at 294

<sup>455</sup> Constance at 401. According to this author, the computer, using a component called a matcher, can search a candidate print against the file prints, at a rate of 500 to 600 prints per second. The latest developments in image storage and retrieval technology also allow the digitised search prints and the retrieved image of the candidate file prints to appear on the computer screen for comparison. See however, R Saferstein *Criminalistics: An introduction to Forensic Science* (1995) 423 (cited in Nickell and Fischer at 124) who states that a set of ten fingerprints can be searched against a file of 500 000 ten-finger prints in about eight-tenths of a second.

<sup>456</sup> Nickell and Fischer at 124

<sup>457</sup> Tarantino at 68

<sup>458</sup> Constance at 400

<sup>459</sup> Constance at 418. New York has recognised the need for safeguards, and has established a finger imaging process which does not allow for the termination of benefits until several individuals in the chain of command have reviewed the fingerprint match and a manual review of the prints has been completed.

<sup>460</sup> J Shattuck 'In the Shadow of 1984: National Identification Systems, Computer-Matching, and Privacy in the United States' (1984) 35 *Hastings Law Journal* 991 at 995

### 3.3 Polygraph testing

#### 3.3.1 The theory behind polygraph testing

The modern day polygraph uses a variety of instruments to detect measurable physiological changes. These changes, which are in theory produced by intervening emotional states, are revealed in the recordings of the polygraph.<sup>461</sup> The polygraph technique is based on two premises:<sup>462</sup>

- (1) the physiological stress caused by the fear of detection will produce involuntary physiological responses; and
- (2) a polygraph examiner, based on these responses, can detect deception.

There is no doubt that high-quality polygraphs can now accurately detect, measure and record the physiological responses of blood pressure, pulse, respiration and galvanic skin resistance; however it is important to realise that the polygraph itself cannot detect either deception or fear of detection. Rather, the polygraph examiner must interpret the recorded measurements and, in appropriate circumstances, infer the presence of deception.<sup>463</sup> It is with this interpretative process that difficulties can arise. If the polygraph examiner lacks the ability, experience or education to interpret the results accurately, or is biased or lacks integrity, the test results are of little use. Moreover, even if the examiner is properly qualified, unbiased, and capable of correctly interpreting the recorded responses, there are still a variety of factors, which may invalidate the test. Examples are as follows:<sup>464</sup>

- (1) The person being examined lacks fear of detection. What is being recorded is the examinee's belief that he is deceiving the examiner; thus, no deception will be detected by the polygraph in this instance.

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<sup>461</sup> Tarantino at 205. The first polygraph, developed in 1921 by John Larson, was capable of recording blood pressure changes, pulse and respiration. Leonard Keeler later added to the polygraph a refined galvanic skin response and developed the "Keeler" polygraph, which is most widely used today. The Keeler polygraph has three main components: (1) a cardiosphygmograph which measures heart rate and blood pressure; (2) a pneumograph which measures respiratory rate; and (3) a galvanometer which measures the variations in the flow of electrical current through the body.

<sup>462</sup> PC Giannelli and EJ Imwinkelried *Scientific Evidence* (1986) 232

<sup>463</sup> Tarantino at 205

<sup>464</sup> See Tarantino at 206

- (2) Fear of false accusation may lead to responses that mimic deception, or unrelated guilt feelings may affect the results.
- (3) Physical abnormalities, including respiratory disorders, abnormal blood pressure and heart disease may affect the physiological responses of the examinee.
- (4) Mental abnormalities, including low intelligence, psychosis, and neurosis may lead to incorrect conclusions that the examinee is trying to deceive the examiner.
- (5) Drug use may effect test results.<sup>465</sup>
- (6) Emotional tension or simple nervousness induced by fear of the test itself may cause the polygraph to record distinct physiological changes that may be incorrectly interpreted as deception.

It is clear then that the focus on the scientific validity of polygraph results should be on the polygraph examiner – his qualifications, procedures and technique – rather than on the polygraph itself.<sup>466</sup> The polygraph examiner must have the necessary expertise to interpret the physiological responses detected by the machine, to distinguish truth from deception properly, and to rule out correctly or ascertain other causes for physiological responses that might indicate deception. Before the examiner conducts a polygraph test, he must familiarise himself with as much information as possible concerning the incident under investigation. This is necessary in order to allow him to formulate the appropriate relevant, irrelevant and control questions.<sup>467</sup>

In order for polygraph results to be valid, the examiner must:<sup>468</sup>

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<sup>465</sup> For example, the intake of alcohol during the commission of the crime reduced detectability of deception (see D Brady and PB Ainsworth 'Alcohol and Psychophysiological Detection of Deception' (1984) 21 *Psychophysiology* 63)

<sup>466</sup> In the case of *United States v Pasado* 57 F3d 428, 434 (5<sup>th</sup> Cir 1995) the court stated that most of the error in polygraph results is attributable to the training and competence of the examiners.

<sup>467</sup> Tarantino at 215. Irrelevant questions are used both at the beginning and end of the test. They are questions to which the examinee should have a 'normal' physiological response, creating a baseline for the examiner. These questions relate to age, name, date of birth etc. Relevant questions are crucial to the incident under investigation. It is important that relevant questions be clear, specific, non-compound and unemotional. Control questions serve as basis for comparison with the relevant questions. Basically, a control question involves a known or assumed lie. Relevant questions, standing alone, can lead to ambiguous and conflicting interpretations. A comparison of the physiological responses to relevant questions with those of control questions can in theory clarify results.

<sup>468</sup> See Tarantino at 207-208

- (1) review the suitability of the examinee for testing purposes;
- (2) conduct an appropriate preliminary investigation and pre-test interview;
- (3) devise appropriate test questions;
- (4) establish confidence and rapport with the examinee;
- (5) stimulate the examinee to react physiologically through a series of relevant, irrelevant and control questions;
- (6) correctly interpret the polygram charts;
- (7) be able to detect attempts on the part of the examinee to 'beat' the machine; and
- (8) conduct an appropriate post-test interview.

### 3.3.2 The admissibility of polygraph evidence in various jurisdictions

There is great debate in the scientific and legal fields over the reliability of the polygraph. Despite the controversy, polygraph testing continues to be used in a variety of settings, both civil and criminal.<sup>469</sup> The United States of America makes the widest use of polygraph technology. Countries such as West Germany and Holland specifically outlawed the criminal use of polygraphs at the beginning of the 1990, and in these countries there was no industrial use of the polygraph. In Japan, polygraphy was carried out only by the police, and polygraph tests were never used for employment purposes. In Australia polygraphy is generally seen as unacceptable, and very little use is made of the technique. Israel, like the United States, has a highly developed system of polygraph testing and research. South Africa has in the past adopted an approach similar to that of the former West Germany and Holland, but in recent years the use of polygraph testing, especially in employment, has escalated and appears to be similar to the American experience.<sup>470</sup>

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<sup>469</sup> For an overview of the history and current use of polygraphs world-wide, see the website of the Polygraph Association of South Africa (PASA) at <http://www.pasa.co.za>

<sup>470</sup> M Christianson 'Truth, Lies and Polygraphs: Detecting dishonesty in the workplace' (1998) 8 *Contemporary Labour Law* 1 at 2-3. See also *Shinga v Gilbeys Distillers and Vintners (Pty) Ltd* (Industrial Court of South Africa, Case No. NHN11/2/10237) as cited on the PASA website, where a polygraph expert states that he alone had performed over 2200 polygraph examinations between 1996-1999.

### 3.3.2.1 The admissibility of polygraph evidence in the United States of America

The admissibility of polygraph test results depends on several factors, including whether the results are offered in a civil case, a criminal case, or for purposes of employment screening. In some jurisdictions in the United States, admissibility is contingent upon statutory prerequisites or stipulations to admissibility by both sides.<sup>471</sup> In the landmark 1923 case of *Frye v United States*<sup>472</sup> the court held that the polygraph machine had not yet gained general acceptance in the field of physiology and psychology; consequently it rejected the admission of polygraph test results. For over forty years, most courts in the United States followed *Frye* and rejected polygraph evidence. Finally, in *United States v Ridling*<sup>473</sup> a federal court addressing a perjury count accepted the theory of the polygraph as sound and directly relevant to the (perjury) issue before the court. The court held that the results of the polygraph examination would be admissible if the court selected the expert, if the court-appointed expert determined that the results indicated either truth or deception and, if allowed to testify, the defendant could counter with his own expert testimony. One state court also admitted polygraph test results, finding that the polygraph did in fact meet the *Frye* standard and enjoyed general acceptance among authorities, including psychologists, researchers and polygraph examiners.<sup>474</sup> In *United States v Zeiger*<sup>475</sup> the court admitted polygraph results and held that the polygraph had been “accepted by authorities as being capable of producing highly probative evidence in a court of law, when properly used by competent, experienced examiners”. Finally, in *United States v Wainwright*<sup>476</sup> a court of appeals, although denying the admission of polygraph results, opened the door for future admission by stating that “matters of proof must keep pace with developing scientific standards.”

The judicial approach to polygraph evidence in the United States seems to have been altered by these decisions and the attention they received in the literature. Generally, decisions in the United States, can be divided into three groups: those courts that adhere to the traditional position, holding polygraph evidence *per se* inadmissible; those courts which admit polygraph

<sup>471</sup> Christianson at 2

<sup>472</sup> See paragraph 2.4 *supra*.

<sup>473</sup> 350 F Supp 90 (ED Mich 1972) at 99 (cited in Giannelli and Imwinkelried at 242)

<sup>474</sup> See *People v Cutter*, 12 Crim L Rptr (BNA) 2133 (Cal Super Ct Nov. 6, 1972) cited in Tarantino at 222

<sup>475</sup> 350 F Supp 685 (DDC) *rev'd*, 475 F2d 1280 (DC Cir 1972)) cited in Giannelli and Imwinkelried at 243

<sup>476</sup> 413 F2d 796, 803 (10<sup>th</sup> Cir 1969) – see Tarantino at 223

evidence upon stipulation; and courts that have held that the admissibility of polygraph evidence rests within the discretion of the trial court.<sup>477</sup> The courts in the United States have in recent years generally accepted that a *per se* ban on the admissibility of polygraph evidence can no longer be enforced.<sup>478</sup> In the case of *United States v Pasado*<sup>479</sup> the court enquired into the admissibility of polygraph evidence in light of the decision in *Daubert* (supra).<sup>480</sup> The *Pasado* court held the *per se* ban on polygraph evidence untenable. Following the principles established in *Daubert*, on appeal the court in *Pasado* held that the crux of the reliability enquiry is whether the evidence is based on a solid foundation rather than speculative belief. Noting *inter alia* the scientific advances in the field of polygraph examination, the court went on to suggest that an inquiry into the admissibility of polygraph evidence should consist of three steps:<sup>481</sup> Firstly, the court must determine whether the evidence is relevant and reliable. Secondly, the court must determine if the evidence will assist the trier of fact to determine a fact at issue. Thirdly, the court must decide if the evidence has an unfairly prejudicial effect that would substantially outweigh its probative value.<sup>482</sup> Referring to the third factor, the court held that polygraph evidence should not be the deciding factor in a case where two plausible, but conflicting factual accounts exist.<sup>483</sup> For courts still using the *Frye* standard of general acceptance, the question arises where and by whom the polygraph must be accepted before its results become admissible. Most courts still hold that it must be accepted in the fields of

<sup>477</sup> Giannelli and Imwinkelried at 243-244. It is important to note that, although the cases cited seem to indicate a trend towards admissibility, *Zeiger* was reversed per curiam by a federal court of appeals, while *Ridling and Cutter* were never appealed, thus precluding the opportunity for appellate approval.

<sup>478</sup> Christianson at 2. The Employee Polygraph Protection Act of 1988 now regulates the use of polygraphs in employment in the United States of America. The use of polygraphs for employment purposes is prohibited, with the exception of security firms, alarm companies and related industries.

<sup>479</sup> 57 F3d 428 (5<sup>th</sup> Cir 1995)

<sup>480</sup> In the years since the *Daubert* decision, the principles espoused in that case have been applied to polygraph evidence in a number of cases. In *United States v Galbreth* 908 F Supp 877 (DNM 1995) polygraph evidence was held admissible, yet in *United States v Cordoba* 991 F Supp (CD Cal 1998) polygraph evidence was held inadmissible under both *Daubert* and Federal Rule 403. See generally, D Gallai 'Polygraph Evidence in Federal Courts: Should it be admissible?' (1999) 36(1) *American Criminal Law Review* 87

<sup>481</sup> See Christianson at 4

<sup>482</sup> A closer analysis of these three factors reveals that they encompass the requirements set out in rules 401, 403 and 702 of the Federal Rules of Evidence (discussed in paragraphs 2.1 and 2.4 supra). See also Gallai (supra) for a contrary opinion on the admissibility of polygraph evidence in discussing the case of *United States v Scheffer* 118 S Ct 1261 (1998), especially the application of Federal Rule 403.

<sup>483</sup> Christianson at 4

physiology and psychology, while other courts have broadened the field to include polygraph examiners as well.<sup>484</sup>

The rejections of polygraph evidence have been based on a number of factors, including the lack of standards for the polygraph examiner, the subjective nature of the examiner's interpretation, and the fact that many physiological, psychological and emotional factors can affect the test results.<sup>485</sup> Some courts hold to the *per se* rule of exclusion on the grounds that the polygraph will intrude on the jury's fact finding process or that polygraph tests will prejudice the jury.<sup>486</sup> Regardless of this *per se* inadmissibility, polygraph results may still be admissible at the sentencing phase, and some courts allow the admission of polygraph results if stipulated to by the parties.<sup>487</sup>

The admissibility of polygraph tests has also been argued on constitutional grounds. The most common constitutional argument is that the polygraph test should be admitted into evidence because the defendant has a right to present a defence.<sup>488</sup> In *United States v Gipson*<sup>489</sup> the United States Court of Military Appeals held that the results of a polygraph examination may be admissible evidence at a court-martial. The court also stated that military courts were no longer bound by the *Frye* standard for admitting evidence. The court stated that the various provisions of the Military Rules of Evidence form sufficient guidelines to admit expert testimony on scientific evidence, including polygraph evidence. In the court's opinion, polygraph evidence, whether offered by the prosecution or the defence, may be admissible

<sup>484</sup> See *United States v Wilson* 361 F Supp 510 (D Md 1973). Problems with including polygraph examiners in the field of scientist include the possibility of inherent bias on the part of such examiners, as well as possible lack of the necessary training in the scientific fields which relate to the polygraph test (see *United States v Alexander* 526 F2d 161 (8<sup>th</sup> Cir 1975); cited in Giannelli and Imwinkelried at 245)

<sup>485</sup> See respectively, *State v Catanese*, 368 So 2d 975 (La 1979); *State v Frazier*, 252 SE 2d 39 (W Va 1979); and *People v Byrnes*, 88 Ill 2d 225, 430 NE 2d 1070 (1981); cited in Tarantino at 224

<sup>486</sup> See *State v Catanese* (supra). See also Gallai at 102-105

<sup>487</sup> Several cases have held that the sentencing judge may take almost anything into account as sentencing criteria, including hearsay, and evidence that would normally be held inadmissible and irrelevant. Obviously, by admitting polygraph evidence on stipulation, the court focuses on the agreement of the parties rather than on the scientific validity of the polygraph (see Tarantino at 225-226).

<sup>488</sup> See Tarantino at 231. For example, in *Jackson v Garrison* 495 F Supp 9 (WDNC 1979), *rev'd*, 677 F2d 371 (4<sup>th</sup> Cir 1981) the trial court held that refusal to admit polygraph test results would deny the defendant a fair trial. *Jackson* was overruled on appeal, and other cases have found that a due process right to present a defence based on polygraph test results have little precedential value.

<sup>489</sup> 41 Crim. L. Rep. (BNA) 2361 (C.M.A. July 13 1987). See paragraph 2.4 supra.

depending on the following:<sup>490</sup> (1) the competence of the examiner; (2) the suitability of the examinee; (3) the nature of the testing process; and (4) miscellaneous other questions, including the same questions posted by *Frye*. The court in *Gipson* also held that the party offering the polygraph evidence must bear the burden of establishing a foundation for the evidence, based on relevance.

Subsequent to the *Gipson* decision, Military Rule of Evidence 707 was enacted, which makes polygraph results inadmissible as evidence in military court martial proceedings. In *United States v Scheffer* (supra)<sup>491</sup> the defendant challenged the constitutionality of Military Rule of Evidence 707 in denying him his right to present a complete defence, by not allowing an exculpatory polygraph examination into evidence. The court noted that a defendant's right to present a complete defence is not unlimited, but rather limited to the right to present relevant evidence. The court must ensure that only reliable evidence is introduced at trial, preserving the jury's role in determining credibility, and avoiding litigation that is collateral to the primary issue.<sup>492</sup> The Supreme Court thus held that the military's *per se* exclusionary rule on polygraph evidence should be allowed to stand.

Gallai<sup>493</sup> in assessing the admissibility of polygraph evidence under *Daubert* submits that the technique of polygraphy cannot be tested, since it lacks a 'ground truth' and can merely detect subjective truth. In addition, error rates cannot be accurately determined and there is no uniform set of operational standards. The author thus submits that under the *Daubert* criteria (and thus Federal Rule of Evidence 702) polygraph evidence should be held inadmissible. In addition, he is of the opinion<sup>494</sup> that Federal Rule 403<sup>495</sup> could become a powerful obstacle to admitting such evidence, regardless of the *Daubert* analysis.<sup>496</sup> Rule 403 essentially requires that the court conduct a balancing test to determine the admissibility of a piece of evidence. The first step would be to ascertain the probative value of polygraph evidence, which would involve an analysis under the *Daubert* criteria. Once the probative value of the polygraph

<sup>490</sup> See Tarantino at 232-233

<sup>491</sup> See Gallai at 110-112

<sup>492</sup> *United States v Scheffer* at 1264-1265

<sup>493</sup> At 93-102

<sup>494</sup> At 102-107

<sup>495</sup> See paragraph 2.1 supra

<sup>496</sup> See, for example, *United States v Sherlin* 67 F3d 1208 (6<sup>th</sup> Cir 1995) at 1217, where the court stated that Rule 403 offers a basis for excluding polygraph results independent of *Daubert*.

evidence has been determined, the factors that could lead to the inadmissibility of the evidence should be considered.<sup>497</sup> A court may thus very well find that the probative value of polygraph evidence is substantially outweighed by the prejudicial effect of such evidence.

### 3.3.2.2 Polygraph evidence in South Africa

The landmark case in South Africa regarding 'lie-detection' tests was *Mahlangu v CIM Deltak, Gallant v CIM Deltak*,<sup>498</sup> a case heard before the Industrial Court in 1986. In this case, use was made of the Mark II voice-analyser (essentially a monograph and not a polygraph), for lie-detection purposes. The court held<sup>499</sup> that it had not been the practice in South African courts, whether in civil or criminal matters, to accept evidence of lie-detector tests. Due to the lack of relevant local case law, the court referred to decisions of foreign jurisdictions<sup>500</sup> and excluded the evidence on the basis that it had not been proven to be reliable. In the same year as the *Mahlangu* case, a certain Mr. Higgins was charged in the Johannesburg Regional Court for contravening section 37(2)(c) of the Medical and Dental and Supplementary Health Services Act<sup>501</sup> by conducting a polygraph examination without being a registered psychologist.<sup>502</sup> Mr. Higgins was acquitted after the court found that the provisions of the Act were too vague to determine whether the polygraph was a psychometric test as described in the Act. The court was thus unable to make a determination as to whether the use of the test by a person not registered as a psychologist was prohibited.<sup>503</sup>

In the recent CCMA<sup>504</sup> case of *Mncube v Cash Paymaster Services (Pty) Ltd*<sup>505</sup> the Commissioner (Ms Pillay) accepted that a trained polygraphist, who was a member of both the

<sup>497</sup> Gallai at 102. The author submits that the factors mentioned in Rule 403 can be divided into three categories: (1) the prejudicial nature of the evidence; (2) the ability of the evidence to usurp the role of the jury; and (3) the amount of time that would be consumed in the presentation of such evidence.

<sup>498</sup> 1986 (7) ILJ 346

<sup>499</sup> At 354D

<sup>500</sup> At 353E-354B

<sup>501</sup> Act 56 of 1974

<sup>502</sup> *The Citizen* September 1986

<sup>503</sup> See Christianson at 15-16 who points out that that the recently constituted Health Professionals Council of South Africa (HPCSA) in its first Bulletin (*HPCSA Bulletin July 1999 Vol 1:1* at 7) states that the polygraph or lie-detector test is completely unreliable, and that the Board does not accept it as a reliable psychological or psychometric test. Yet it seems as if the Board is of the opinion that it is the controlling body for the administration of polygraph tests and suggests that such tests should only be carried out by registered psychologists.

<sup>504</sup> Council for Conciliation, Mediation and Arbitration

<sup>505</sup> [1997] BLLR 639 (CCMA)

American and South African Polygraph Associations could be accepted as an expert witness. Finding that such an expert's opinion evidence could be admissible, the commissioner went on to examine the reliability of the evidence. The commissioner found the employee's version of events improbable, but due to the fact that the polygraph test results were inconclusive, they were excluded as being unreliable, because the data on which the expert had based his opinion was not reliable.<sup>506</sup> In the case of *Shinga v Gilbeys Distillers and Vintners (Pty) Ltd*<sup>507</sup> the Industrial Court considered the evidence of a polygraph examiner, but found the evidence to be unreliable due to the fact that various medical conditions as possible causes for the responses seen on the polygraph could not be excluded.<sup>508</sup> The court held that the polygraph test is inherently unreliable in the absence of evidence *aliunde*.<sup>509</sup> In addition, the 'human variable', namely, the fact that the performance and methodology of the operator can materially affect the results of the tests, prevented the court from being able to consider such tests as 'scientific'.<sup>510</sup>

### 3.4 Bite mark evidence

Courts often compare bite mark evidence and fingerprint evidence. However, in comparison to fingerprinting, bite mark analysis is a technique that is used only sporadically.<sup>511</sup> The term 'bite mark' is defined as a mark made by the teeth either alone or in combination with other mouth-parts.<sup>512</sup> Studies have shown that the uniqueness of each individual's dentition is almost as great as that of fingerprints. A match of five common characteristics per tooth in a bite mark containing five teeth, is considered sufficient to establish beyond reasonable doubt that no other individual could have produced the bite mark in question.<sup>513</sup> The foundation of bite mark evidence rests on the following two postulates: first, that each individual's dentition is unique; and second, that the presumed uniqueness of each individual's dentition is accurately recorded

<sup>506</sup> At 641-642

<sup>507</sup> Industrial Court, Durban; Case No. NHN11/2/10237; Judgement handed down 21 August 1999

<sup>508</sup> Paragraphs 57 and 59

<sup>509</sup> Paragraph 80

<sup>510</sup> Paragraph 82

<sup>511</sup> MN Aksu and JP Gobetti 'The Past and Present Legal Weight of Bite Marks as Evidence' (1996) 17(2) *American Journal of Forensic Medicine and Pathology* 136

<sup>512</sup> DG MacDonald 'Bite marks: recognition and interpretation' (1974) 14 *Journal of the Forensic Science Society* 229

<sup>513</sup> RD Rawson, RK Ommen, G Kinard, J Johnson and A Yfantis 'Statistical evidence for the individuality of human dentition.' (1984) 29 *Journal of Forensic Science* 245

in the bite mark evidence.<sup>514</sup> The probability of a particular individual being responsible for a crime scene bite mark is a subjective judgement that relies on the experience and knowledge of the dental expert. To date, no appellate jurisdiction in the United States has rejected bite marks as legally admissible evidence.<sup>515</sup>

Bite mark analysis entails the comparison of crime scene evidence with evidence from possible suspects.<sup>516</sup> The expert's interpretation of similarities and dissimilarities establishes a given suspect's probability of making the crime scene bite mark. Bite mark evidence may thus be useful in either the identification or elimination of a suspect.<sup>517</sup>

### 3.4.1 The analysis of bite marks

Human skin and flesh are not good materials for bite mark impression analysis and distinct marks of the biting surfaces of teeth are rarely found in human flesh.<sup>518</sup> The best way of capturing bite mark evidence is by means of standard photography.<sup>519</sup> The methods of analysis of bite marks vary from having suspects make duplicate bites, to techniques involving sophisticated stereographic imagery. According to Chayko and Gulliver<sup>520</sup> the most widely used method is based on geometric projections which relate the biting surfaces of the teeth of a suspect to the bruises and marks of the bite mark evidence.<sup>521</sup> In the last 15 years there have been numerous new approaches suggested for bite mark analysis, however, many of these new methods require elaborate technology which is not readily available to most forensic dentists.<sup>522</sup>

<sup>514</sup> *People v Jennings* 252 Ill 534, 96 NE 1077 (1911) cited in Aksu and Gobetti at 137

<sup>515</sup> Aksu and Gobetti at 137

<sup>516</sup> See GM Chayko and ED Gulliver (eds.) *Forensic Evidence in Canada* (1999) 376-377. These authors list the following situations where bite mark evidence might be found: 1) Inanimate objects such as foods, pencils, pipe stems and chewing gum; and 2) On humans, (a) made by animals, or (b) made by humans during assault, sexual activity, or self-inflicted.

<sup>517</sup> Chayko and Gulliver at 377

<sup>518</sup> See Chayko and Gulliver at 377. Distortion often occurs since it is unlikely that a conscious, unwilling victim would passively allow bites to be inflicted. In addition, the dynamic processes of inflammation and haemorrhage distort tissues immediately after the bite is made.

<sup>519</sup> Chayko and Gulliver at 378. These authors state that the best photographic evidence may require that the living subject be photographed using both black and white and colour photography over a period of 72 hours or more.

<sup>520</sup> At 379

<sup>521</sup> More recent scientific techniques, such as phase contrast microscopy and saliva swabbing, are being introduced to sustain a bite mark match. However, willingness to accept bite mark evidence seems to relate more to the physical nature of the bite marks than to analysis substantiating the scientific basis or accuracy of the procedure (see Aksu and Gobetti at 136-137).

<sup>522</sup> Chayko and Gulliver at 380. The authors list the following techniques: trans-illumination, radiography,

Although some of the novel techniques have been applied to a single case, they have not been tested and therefore cannot be referred to as standard methods for the analysis of bite marks.

The value of bite marks left in inanimate object will depend greatly on the nature of the substrate.<sup>523</sup> Objects such as wood, polystyrene cups and some waxes leave durable and long-lasting marks. Some foodstuffs such as chocolate and cheese, if carefully stored, can preserve detailed expressions of the biting surfaces of teeth. However, food with a high water content such as fruits and vegetables are subject to rapid deterioration and spoilage and bite marks on these objects will not be long-lasting.<sup>524</sup>

### 3.4.2 Challenges to the admissibility of bite mark evidence

The development of the use of dental evidence was initially slow because the courts were not readily persuaded of its reliability.<sup>525</sup> Early appeals of bite mark cases in the United States involved the constitutional right against self-incrimination as stated in the Fifth Amendment. Some cases also focused on the constitutional protection against unreasonable search and seizure guaranteed under the Fourth Amendment, and due process as protected by the Fourteenth Amendment.<sup>526</sup> Appeal courts in the United States have upheld the taking of dental impressions from suspects, stating that the dental impressions were similar to fingerprints and handwriting samples, and as such, were not within the protection of the Constitution.<sup>527</sup> Later legal challenges concerned the accuracy of identifications made on the basis of bite mark

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scanning electron microscopy, lifting of bite prints, application of computerised axial tomography and alternative light source illumination.

<sup>523</sup> Chayko and Gulliver at 381

<sup>524</sup> See Chayko and Gulliver at 382, who point out that even if kept in a freezer, most foodstuffs will eventually deteriorate, distort and shrink. Photographs of these objects should thus incorporate a ruler and some indication as to orientation.

<sup>525</sup> Aksu and Gobetti at 137. The admission of bite mark evidence in legal proceedings can be traced back to 1692 in the United States, when the Reverend George Barrows stood accused of "tormenting and soliciting young women into witch craft." The precedent setting case in English speaking countries occurred in 1967 in Biggar, Scotland, when a murderer was brought to trial and convicted primarily through the presentation of bite mark evidence. In Canada, the first significant case was presented in the Alberta Supreme Court in 1972, where a Dr Swan provided in great detail, bite mark evidence which led to the conviction of one Wayne Boden (see Chayko and Gulliver at 376). The year 1972 also marked a turning point in the area of bite mark evidence and dental forensics in the United States: the 1972 trial of John R Rice was the first modern legal action in the USA in which bite mark evidence introduced during trial sustained a murder conviction (see Aksu and Gobetti at 137)

<sup>526</sup> Aksu and Gobetti at 138. These constitutional issues were dismissed in *People v Allah*, 84 Misc 2d 500, 376 NYS 2d 399 (1975) and *People v Milone*, 43 Ill App 3d 385, 356 NE 2d 1350 (1976)

<sup>527</sup> *Patterson v State*, 509 SW 2d 857 Tex Crim (1974) cited in Aksu and Gobetti at 138

evidence. However, the courts have generally ruled that bite mark evidence does have the general acceptance of the scientific community, as required by *Frye v United States* (supra).<sup>528</sup> Evidentiary concerns at present revolve around whether expert testimony, such as that regarding bite marks, is unduly prejudicial to the defendant – that is, whether the benefit of the evidence outweighs any prejudicial effect.<sup>529</sup> However, in 1993, the Arizona Supreme Court in *State v Bible*<sup>530</sup> held that with evidence based on principles and procedures comprehensible to the jury, such as bite mark evidence, concerns of undue influence have little significance. In *People v Marx*<sup>531</sup> a California court of appeal diminished the importance of the expert in bite mark cases, claiming that dental evidence was clear and straightforward. The court stated that while experts were important in ensuring that acceptable techniques were adhered to, the jury itself could see what the expert had been reviewing in his evidence. Thus the jury could reach its own conclusions from the evidence presented by the expert and need not be in complete reliance on the expert's conclusions.

The unresolved area, on which most recent appeals against the admission of bite mark evidence focus, concerns the role of the expert in analysing the dental evidence.<sup>532</sup> The lack of accepted uniform standards continues to leave this area open for attack from the legal profession.<sup>533</sup> Bite marks are legally admissible as evidence as long as the testifying dental expert is properly qualified and the correct scientific procedures were used to gather the evidence.<sup>534</sup> In *People v*

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<sup>528</sup> As discussed in paragraph 2.4, the more recent case of *Daubert v Merrell Dow Pharmaceuticals* (supra) eliminated the 'general acceptance' requirement in federal courts in the United States.

<sup>529</sup> Aksu and Gobetti at 138

<sup>530</sup> *State v Bible* 858 P2d 1152 (Ariz 1993); see paragraph 3.1.3 supra

<sup>531</sup> 54 Cal App 3d 100, 126 Cal Rptr 350 (1975) cited in Aksu and Gobetti at 138

<sup>532</sup> See Chayko and Gulliver (at 383) who submit that the attack on bite mark evidence should be on all fronts, and should begin with an examination of the credentials of the expert. They point out that being an experienced forensic dentist (that is, being able to identify victims based on dental records) does not necessarily mean that the dentist is an expert in bite mark analysis.

<sup>533</sup> Aksu and Gobetti at 139. Most problematic in resolving this issue is the contention by forensic odontologists that there is no particular right or wrong way in which to analyse a bite mark, so long as the method used is scientifically sound and legally acceptable. Many legal arguments concerning the admissibility of bite mark testimony have been based on the lack of standardisation among forensic odontologists. Four different groups of dentists in the United States have claimed to be qualified in bite mark analysis. The certification process and publications of each group are independently determined and only one group (The American Board of Forensic Odontology) publishes guidelines for the management of bite mark evidence. On the one hand, this lack of uniformity allows for the individualisation of techniques; at the same time, it also leaves forensic odontologists open for legal attack.

<sup>534</sup> See, for example, *People v Sloan* 76 Cal App 3d 611 at 625, 143 Cal Rptr 61 (1978) cited in Aksu and Gobetti at 139. The courts have generally been unanimous in accepting that someone is an expert in bite mark analysis, but none of the reported cases have set standards for the qualifications required by the expert in such cases.

*Milone* (supra) the court held that lack of unanimity among members of the medical profession as to the reliability of certain scientific testimony does not mean that such testimony fails to meet the criteria established in *Frye*. In *State v Stinson*<sup>535</sup> the court noted that no other jurisdictions had rejected the admission of bite mark evidence, and while recognising no standard in the analysis of bite mark evidence, the court held that bite mark identification was an exact science.

Serious questions have arisen as to whether bite marks are in fact reliable in identifying assailants. The *Milone* case bears this criticism out:<sup>536</sup> While Milone was incarcerated for murder, another double murder was discovered in the same area as the Milone murder. A suspect was arrested, and comparison of the bite marks in the double murder and on the victim in the Milone murder proved that they were remarkably similar, and that they were similar to the suspect's teeth. The suspect subsequently confessed to the Milone murder, but Milone still stands convicted of the original murder mainly due to bite mark evidence. This case clearly suggests an agreement with the statement by Aksu and Gobetti<sup>537</sup> that "bite mark evidence needs further scrutiny before the courts assume the basic premise that the process is well established and accurate. In particular, the technique of bite mark analysis should be re-evaluated to determine whether sufficient data has been gathered to substantiate its use in a judicial setting. Evaluations must be objective and evidence should be clear enough for the trier of fact to comprehend the analysis. The techniques used in the analysis should have a clear scientific basis. Bite mark analysis seems to have greater success as a means of excluding suspects, than as analysis that attempts to match a suspect with a wound, and it is important for the legal and dental communities to understand the limitations of bite mark evidence."

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<sup>535</sup> 134 Wis 2d 224 (at 228, n2), 397 NW 2d 136 (1986) cited in Aksu and Gobetti at 139

<sup>536</sup> See generally Aksu and Gobetti at 139-140

<sup>537</sup> At 140

### 3.5 Psychiatric evidence

#### 3.5.1 The nature and admissibility of psychiatric evidence

Psychiatric evidence in court is mostly sought on two issues: the defendant's capacity to stand trial and the sanity (or not) of the defendant.<sup>538</sup> If a defendant lacks competency to stand trial, there is no immediate need for an insanity determination. On the other hand, if a defendant is insane at the time of trial, he also lacks the competency legally required to proceed.<sup>539</sup> Often, in the mind of the psychiatrist, competency is seen as the same thing as sanity. However, the medical definition of these two terms differs from the legal definition. Competency refers to a defendant's mental condition at the time of the trial and should be distinguished from insanity, which refers to the defendant's mental condition at the time of the offence.<sup>540</sup> A defendant is generally ruled incompetent to stand trial if he is unable to understand the charges against him and unable to assist in his own defence.<sup>541</sup> According to South Africa law, before the court can find the accused is not fit to stand trial, it has to receive a report under section 79 of the Criminal Procedure Act.<sup>542</sup> Before such a report can be made, the accused must be sent for observation as contemplated in this section.<sup>543</sup> People found incompetent to stand trial are institutionalised until found competent, at which time they may be tried for their actions.<sup>544</sup>

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<sup>538</sup> In South Africa, psychiatric evidence may be sought in terms of the following sections of the Criminal Procedure Act 51 of 1977: the questions of the accused's capacity to understand proceedings (section 77) and the issue of mental defect or mental illness and its effect on criminal responsibility (section 78).

<sup>539</sup> Becker at 54

<sup>540</sup> Giannelli and Imwinkelried at 276. The authors point out that the policy issues raised by the insanity defence differ substantially from those raised by an accused's competency to stand trial. Insanity concerns the defendant's culpability for his criminal acts; it is a substantive criminal law issue. In contrast, mental competency involves a due process issue.

<sup>541</sup> Section 77(1) of the Criminal Procedure Act of 1977 states that "if it appears to the court at any stage of criminal proceedings that the accused is by reason of mental illness or mental defect not capable of understanding the proceedings so as to make a proper defence, the court shall direct that the matter be enquired into and be reported on in accordance with the provisions of section 79."

<sup>542</sup> *S v Matjhisa* 1981 (3) SA 854 (O) at 855G-H. See the reference to section 79 in section 77(1) supra

<sup>543</sup> *Du Toit et al* at 13-3. Before the court can send the accused for observation under section 79 it must be satisfied that some factual or medical basis has been laid for the allegation that the accused is incompetent to stand trial. No onus rests on the accused at this stage and once a reasonable possibility exists from an objective consideration of all the information placed before the court, it has to direct the inquiry (see *S v Tom & others* 1991 (2) SACR 249 (B) at 250h-251c).

<sup>544</sup> Becker at 61. In South Africa, the court will direct that the accused be detained as a Minister's decision patient, after which the accused will fall under the control of the Minister of Justice (section 28 of the Mental Health Act 18 of 1973). The accused is neither acquitted nor convicted at this stage; declaration as a patient is merely a measure in the interests of society (see *Du Toit et al* at 13-5).

Becker<sup>545</sup> claims that in most instances of psychiatric testimony in the United States, information gathered from the defendant is gleaned as the result of an initial interview (often the only interview) rather than a course of lengthy treatment sessions.<sup>546</sup> The idea is to form an opinion as to an individual's ability to tell the difference between right and wrong and accordingly to conform his behaviour to these notions.<sup>547</sup> There is no definitive rule upon which all experts can agree as to the minimum time necessary to determine competency or legal sanity.<sup>548</sup>

Opinion testimony of mental health experts is often viewed sceptically by the judiciary, lawyers and jurors. This lack of credibility is sometimes a product of the inadequate information upon which the expert is attempting to base an opinion, or the absence of any so-called 'hard data'. Such hard data is information gathered from employment records, medical records, psychometric testing, and witnesses of the defendant's behaviour at or near the time of the crime.<sup>549</sup> In terms of South African law, because all people are presumed sane until the contrary is proved, the burden of showing that the accused is criminally not responsible because of mental illness or mental defect is on the defence.<sup>550</sup> The qualification of an expert to testify in support of an insanity defence might be an issue in some cases. For example, in *Jenkins v United States*<sup>551</sup> the trial court had held that a psychologist was not competent to give an opinion regarding a mental disease or defect, apparently on the grounds that psychologists lack medical training. The DC circuit court reversed the trial court's decision, admitting that indeed many psychologists would not be qualified to testify on those matters,

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<sup>545</sup> At 63

<sup>546</sup> In South Africa, the report in terms of section 79 of the Criminal Procedure Act is done by one, two, or three psychiatrists, depending on the crime involved; and the period of observation is 30 days (section 79(2)). See Du Toit *et al* at 13-13 to 13-14.

<sup>547</sup> Becker at 63. In terms of South African law, section 78(1) of the Criminal Procedure Act states that when a person, at the time of commission of the offence, suffers from a mental illness or mental defect which makes him incapable of appreciating the wrongfulness of his act; or acting in accordance with that appreciation, he shall not be criminally responsible for that act.

<sup>548</sup> See Becker at 73. There are legitimate concerns about state psychiatrists who can arrive at these decisions in as little as 15 to 30 minutes. If, however, a complete psychiatric history is taken, an interview conducted, and the necessary tests performed with the object of arriving at the true assessment of the defendant's mental state - using standardised information gathering procedures - there should be little conflict between defence and state experts pertaining to the amount of time spent with the defendant.

<sup>549</sup> Becker at 90

<sup>550</sup> The existence of non-responsibility due to mental illness or mental defect must be proved by the defendant on balance of probabilities (see *S v Mahlinza* 1967 (1) SA 408 (A) at 419A-B). Contrast this to the defence of non-pathological criminal capacity (discussed *infra*): the court held in *S v Rittmann* 1992 (2) SACR 110 (NmHC) that if the defence of non-pathological criminal incapacity is properly raised, the onus rests on the state to prove that the accused is in fact criminally responsible.

but adding that others have extensive training and experience in the diagnosis and treatment of mental disorders and therefore would be qualified. Thus, it is not the title 'psychologist' that is determinative, but rather the nature and extent of the individual psychologist's knowledge.<sup>552</sup> In South Africa, for the purposes of section 79 of the Criminal Procedure Act, the court may only accept reports drawn by psychiatrists, not clinical psychologists, even if they are registered.<sup>553</sup> Psychologists may however, give expert opinion on psychiatric and psychological matters in general.<sup>554</sup> It is for the court to determine that the witness purporting to be an expert has undergone a course of special study or has experience or skill which will render him an expert in a particular subject.<sup>555</sup> The court held in *Holtzhausen v Roodt*<sup>556</sup> that the expertise of the witness should not be elevated to such heights that sight is lost of the court's own capabilities and responsibilities in drawing inferences from the evidence. In *S v Nel*<sup>557</sup> the court held expert psychiatric evidence relating to the relatively normal intellectual and psychological disabilities of a witness inadmissible. In the court's view, psychological disabilities affecting for example, personality, powers of exposition and articulation, recall ability and intelligence are capable of being assessed reasonably adequately by the court, while the witness is giving evidence (as opposed to physical abnormalities affecting the reliability and accuracy of a witness' evidence).<sup>558</sup>

Section 78(7) of the Criminal Procedure Act defines the concept of diminished responsibility.<sup>559</sup> This provision permits the trier of fact to find that the defendant was, at the time of the

<sup>551</sup> 307 F2d 637 (DC Cir 1962) cited in Giannelli and Imwinkelried at 285

<sup>552</sup> *Jenkins v United States* at 644-45. The ABA Criminal Justice Mental Health Standards, which were adopted in the United States in 1984, go beyond the traditional qualification rules and require more stringent qualification standards, including minimal clinical educational and training requirements. In addition, an expert is not permitted to testify concerning a person's mental condition unless he has conducted a thorough evaluation, including a personal interview.

<sup>553</sup> *S v Loyens* 1974 (1) SA 330 (C) at 332C-F. According to section 79(12) of the Criminal Procedure Act, a psychiatrist means a person registered as a psychiatrist under the Medical, Dental and Supplementary Health Service Professions Act 56 of 1974.

<sup>554</sup> In *Holtzhausen v Roodt* (supra) at 772D-E, it was stated that the courts are accustomed to receiving the evidence of psychologists and psychiatrists, particularly in criminal matters.

<sup>555</sup> See *Holtzhausen v Roodt* (supra) at 772G-H

<sup>556</sup> At 772E-F

<sup>557</sup> 1990 (2) SACR 136 (C)

<sup>558</sup> At 143a-g. Although the court conceded that a more accurate and reliable assessment might be made with the aid of expert testimony, it was of the opinion that the cost of admitting such evidence (in terms of affordability and prolonging the trial), would outweigh any benefit gained in the administration of justice.

<sup>559</sup> This section reads as follows: "If the court finds that the accused at the time of commission of the act in question was criminally responsible for the act, but his capacity to appreciate the wrongfulness of the act was diminished by reason of mental illness or mental defect, the court may take the fact of such diminished responsibility into account when sentencing the accused."

offence, impaired in a manner that affects criminal responsibility, but that the effect of the impairment did not justify exculpation. The practical effect of this section could be related to the sentence imposed, particularly within a discretionary sentencing decision, or might reduce the grade of the offence.<sup>560</sup> The application of the concept of diminished responsibility as a factor in mitigation of sentence is likely to be limited to what the courts are prepared to admit as falling within the concept of 'mental illness or mental defect'.<sup>561</sup> The contribution of the forensic psychiatrist in arguing extenuating circumstances in a given case lies in various areas. The psychiatrist should be able to supply a report containing guidelines to counsel, which will allow the detection and demonstration of possible psychological and physiological reasons for certain behaviour in a specific defendant.<sup>562</sup>

The defence of 'temporary non-pathological criminal incapacity' is also recognised in South Africa. With this defence, psychiatric evidence is not indispensable, because the court itself is in a good position to decide, based on all the facts before it, whether a case has been made for the defence raised.<sup>563</sup> In *S v Di Blasi*<sup>564</sup> the courts stated that it is for an accused person to lay a factual foundation for his defence that non-pathological causes resulted in diminished responsibility, and the issue is for the court to decide.<sup>565</sup> In coming to a decision, the court

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<sup>560</sup> See T Zabow 'Psychiatric Evidence in Extenuation: Assessment and Testimony in Homicide Defendants' (1989) 8 *Medicine and Law* 631 at 632-633. The author states that, "It is possible that recognising this patch of grey is consistent with psychiatric testimony which finds, sometimes to the frustration of lawyers, that a line cannot be drawn between the various circumstances of human motivation and its consequent action."

<sup>561</sup> Zabow at 633. In *S v Stellmacher* 1983 (2) SA 181 (SWA), the court held that the terms 'mental illness' and 'mental defect' in section 78 indicate a pathological disturbance of the accused's mental capacity, and not merely temporary confusion which is attributable not to mental abnormality, but to external stimuli such as alcohol. See also *S v Kok* 1998 (1) SACR 532 (N) where the court held (at 544b-h) that the term 'mental illness or mental defect' must be strictly interpreted.

<sup>562</sup> See Zabow at 634-635. Factors, which diminish control in the so-called normal subject, such as brain dysfunction, particularly the epilepsies and the effects of past head injuries, should be clarified and sought as intensively as the factors in an abnormal or insane subject. The psychopath and his personality factors, his associates, peer groups and the influence of others must be looked into and assessed in each case. Emotional influences and the effect of alcohol and other drugs, especially regarding the specific effects on the individual defendant, must be investigated by full assessment and past history. The question of remorse and its assessment becomes part of the psychiatric work-up in view of its importance in the disposition of the individual and the prognosis (that is, in terms of sentence). Beliefs of a less civilised way of life, for example, the belief in witchcraft, may either exclude psychiatric disorder or explain behaviour.

<sup>563</sup> See *S v Calitz* 1990 (1) SACR 119 (A). See also *S v Harris* 1965 (2) SA 340 (A) at 365B-C, where the court held that the crucial issue of the appellant's criminal responsibility for his actions at the relevant time was a matter to be determined, not by the psychiatrists, but by the court itself. In determining that issue, the court must of necessity have regard not only to expert medical evidence, but also to all the other facts of the case, including the reliability of the appellant as a witness and the nature of his proved actions throughout the relevant period.

<sup>564</sup> 1996 (1) SACR 1 (A)

<sup>565</sup> This was confirmed in *S v Van der Sandt* 1998 (2) SACR 627 (W) where the court held that although there

must have regard not only to the expert evidence, but also to all the facts of the case, including the nature of the accused person's actions during the relevant period.<sup>566</sup>

An evidentiary issue that has caused difficulty with psychiatric evidence in the United States, is the so-called 'ultimate issue' rule.<sup>567</sup> The question arises whether an expert may testify that the defendant was insane or knew the wrongfulness of his conduct at the time of the offence. Such an opinion might be excluded because it involves an ultimate issue in the case. Rule 704(B) of the Federal Rules of Evidence of the United States provides: "No expert witness testifying with respect to the mental state or condition of a defendant in a criminal case may state an opinion or inference as to whether the defendant did or did not have the mental state or condition constituting an element of the crime or of a defence thereto. Such ultimate issues are matters for the trier of fact alone."

Giannelli and Imwinkelried<sup>568</sup> are of the opinion that the underlying problem with stating such an opinion is not that it embraces an 'ultimate issue', but rather that it is beyond the witness' expertise. Undoubtedly, a psychiatrist or psychologist who has spent years diagnosing and treating mental disorders can provide the court with helpful information about the origin and effects of a mental disorder. Nevertheless, the authors claim that insanity involves a legal (moral), not a medical, issue and therefore, no matter how the test for insanity is phrased, a psychiatrist or psychologist is no more qualified than any other person to give an opinion about whether a particular defendant's mental condition satisfies the legal test for insanity.

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is no onus on the accused when raising the defence of non-pathological criminal incapacity to establish a factual basis for the defence, it was nonetheless expected. The court held further that expert evidence was not necessary to enable the court to determine whether the accused in fact lacked criminal capacity.

<sup>566</sup> *Di Blasi* at 7c. In this case two experts testified for the respondent on the issue of diminished criminal capacity. See also *S v Kalogoropoulos* 1993 (1) SACR 12 (A) at 22d-e, where the court stated that "the drawing of inferences as to the state of a normal man's mind from the objective facts relating to his conduct is an exercise which is not unique to the psychiatric or psychological professions. Courts of law perform the exercise daily, constantly."

<sup>567</sup> See paragraph 2.1 *supra*

<sup>568</sup> At 285-286

### 3.5.2 Novel techniques in psychiatric evidence

The question arises whether clinical expertise in the area of forensic psychiatry will be supplanted by the latest in brain imaging technology as the ultimate method of behavioural diagnostics.<sup>569</sup> The pressure to have new technology admitted in court come from three sources: Typically, plaintiffs' lawyers in civil cases and defence lawyers in criminal cases represent those parties who have the most to gain from 'innovative' evidence. Secondly, the manufacturers, suppliers and promoters of the technology, (as well as physicians and others with a proprietary interest in, for example, a brain-imaging device), may push for application of the new technology in a legal setting. Together, the lawyers and technological entrepreneurs can exert powerful pressure on the judge to promote premature or inappropriate forensic use of the latest scientific and technological methods. Thirdly, the law itself – in the form of appellate judges and legislators - also plays a role in promoting acceptance of new technology or scientific theory as an aid in resolving court cases.<sup>570</sup>

In the case of *People v Cystkopf*<sup>571</sup> the preliminary decision was that PET scan data concerning the defendant could be admitted, despite the lack of a scientifically established connection between such data and the criminal behaviour at issue.<sup>572</sup> In the *Cystkopf* case, the defendant had no current psychotic disorder and no history of psychiatric problems. The circumstances of this murder case would from any objective perspective not have supported an insanity plea, yet the defence sought to introduce, among other evidence, PET scan images showing areas of hypometabolism in the defendant's brain. PET scan technology *per se* is probably sufficiently accepted today to pass the *Frye* test and certainly to survive any broader considerations governing relevance and reliability.<sup>573</sup> Legal precedent is fairly clear, however, that any novel

<sup>569</sup> Brakel *et al* at 215. The authors discuss the use of positron emission tomography (PET) in a particular case and question whether such novel techniques should actually be allowed to be used for forensic purposes.

<sup>570</sup> Brakel *et al* at 216. Common law judges literally make new law, which consists of recorded decisions of appellate judges through the centuries. Codes and statutes are superimposed on this body of common law, resulting in conflict in some instances, between modern statutes and historical judicial pronouncement. Such a controversy has been brewing in the area concerned with what types of scientific evidence may be introduced at trial. Such questions are far less likely to arise in non-common law countries, and countries where there is no lay jury to hear the evidence and thus, it seems little need to keep out certain types of evidence. (See the discussion on procedural systems *infra*)

<sup>571</sup> 156 Misc 2d 34 591 NYS 2d 715 (1992) cited in Brakel *et al* at 219

<sup>572</sup> See discussion in paragraph 2.4 *supra* regarding the reasons Brakel *et al* put forward for the admission of the PET scan evidence via the 'back door'.

<sup>573</sup> Brakel *et al* at 220. In California, data from PET scans have already been used in a civil lawsuit, and attorneys in that state have also sought to introduce such evidence in the sentencing phase of criminal

scientific evidence, to be admissible, must be relevant in the sense that it has a reasonable connection to the specific factual or legal issues in the case at hand.<sup>574</sup> There does not seem to be a scientific consensus on the relationship (if any) between PET scan patterns and criminal tendencies that passes the causation requirement that courts have found to be embedded in *Frye*. There is a lack of definitive data regarding the relationship of specific PET abnormalities to specific behavioural disturbances, and no basis whatsoever for predicting, from a given individual's functional PET scan abnormalities, any specific behaviour in which that individual might engage.<sup>575</sup> Brakel *et al*<sup>576</sup> are of the opinion that the Federal Rules of Evidence, as interpreted in *Daubert*, are unlikely to cause a court to find sufficiently reliable the speculations of specialists concerning the potential for an arachnoid brain growth to affect (rather suddenly) the cognitive capacities or behaviour of a defendant, as was claimed in the *Cystkopf* case. But the evidence may yet be admitted by the back door, through a reasonable explanation of an opinion regarding the defendant's insanity, expressed by expert witnesses for the defence.<sup>577</sup> The authors do not see the introduction of PET scan evidence in criminal cases as an evil to be avoided at all costs. Rather, they suggest that forensic scientists should work with lawyers to regulate the use of such technology in trial proceedings. In other words, rather than trying to block its entry completely, its application should be limited to the legally and logically most appropriate cases.

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proceedings, to support a reduced sentence. In each of these cases the psychiatric expert testified to PET scan abnormalities being indicative of mental illness, but the PET images themselves were not shown to the jury.

<sup>574</sup> See the discussion regarding relevance in general and also the relevancy requirement in Rule 401 of the Federal Rules of Evidence in paragraph 2.1 *supra*.

<sup>575</sup> See generally HS Mayberg 'Functional brain scans as evidence in criminal court: An argument for causation' (1992) 33 *Journal of Nuclear Medicine* SNM Newline 18N

<sup>576</sup> At 220. The authors beg the question of "how persuasive the average lay-person [in a jury] would find the prosecution expert's assertion that brain pathology had no bearing on the defendant's crime, when confronted by the defence with colourful video images of the defendant's brain, consuming radioisotopes in vividly aberrant ways?" The theory itself will be "bad science", but the prejudicial pictures without any connecting theory are likely to be worse. So, ultimately the defendant might 'get off' with a lighter sentence, despite the unreliability of the evidence.

<sup>577</sup> See paragraph 2.4 *supra*

## CHAPTER FOUR

### PROCEDURAL SYSTEMS AND THE EVALUATION OF EVIDENCE

#### 4.1 Accusatorial and inquisitorial systems of criminal procedure

##### 4.1.1 General characteristics of the two systems

In most countries the administration of criminal justice follows one of two models: the accusatorial<sup>578</sup> model, or the inquisitorial model. The former is the model of the Anglo-American countries, that is, the Common Law world, while the latter can generally be found on the European continent, in the so-called Civil Law countries. Traditionally, in inquisitorial systems, very little emphasis is placed upon procedural law; procedure is merely seen as a vehicle for fact-finding, discovering the truth and deciding individual cases. According to this approach, substantive law<sup>579</sup> guides the judge to the just solution of a case and procedural technicalities should not prevent him from doing so.<sup>580</sup> In Common Law countries, on the other hand, substantive law has often provided vague answers only.<sup>581</sup> It is deemed essential, therefore, in these systems to have a fair procedure, with detailed procedural and evidentiary rules, which will enable both parties to a dispute to present their case and introduce all relevant evidence, while at the same time preventing a jury from being unduly influenced. Elaborate procedural and evidentiary rules have been devised for jury trials, and these rules are usually also applied when a case is heard by a judge only.<sup>582</sup> In no country today does there exist a purely accusatorial or inquisitorial system – in most countries one invariably finds a mixed system with a leaning towards either of the two approaches.<sup>583</sup>

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<sup>578</sup> The accusatorial model of criminal procedure encompasses adversary trial procedure as well as other fundamental premises – see AS Goldstein 'Reflections on Two Models: Inquisitorial Themes in American Criminal Procedure' (1974) 26 *Stanford Law Review* 1009. The term 'adversary trial' or 'adversarial procedure' thus refers to a trial procedure existing within the accusatorial model.

<sup>579</sup> As found in the various Codes of the Civil Law countries.

<sup>580</sup> J Herrmann 'The Anglo-American as opposed to the Continental Approach to Criminal Law' (1981) 14 *De Jure* 39 at 42.

<sup>581</sup> Due to the fact that substantive law was not sufficiently developed in former times, and at present the general guidelines of codes are lacking.

<sup>582</sup> Herrmann (1981) at 42-43

<sup>583</sup> CR Snyman 'The accusatorial and inquisitorial approaches to criminal procedure: some points of comparison between the South African and continental systems' (1975) 8 *Comparative and International Law Journal of South Africa* 100 at 101. South African criminal procedure generally has an accusatorial character, mainly due to the fact that it is based on, and derived from, the English model of criminal procedure.

An accusatory system is essentially a party process in that it involves a two-sided contest, between prosecution and defendant, in a judicial arena. The parties are ideally in an equal position with an impartial moderator, the judge. The judge does not have any initiative in the collection of the evidence, which is exclusively in the hands of the parties.<sup>584</sup> The proceedings are oral, open to the public and generally make use of lay juries.<sup>585</sup> The evidence is mainly tendered by direct examination of witnesses with a right of cross-examination by the opposing party. The adversary system is seen as having a dialectal paradigm for truth seeking, placing emphasis on procedure over substantive result, and a neutral judge concerned only with the integrity of the process.<sup>586</sup>

The inquisitorial system, on the other hand, is usually typified by two basic factors: Firstly, several functions are concentrated in one person, the judge, who in an inquisitorial system acts as both judge and prosecutor. Secondly, the collection of evidence in an inquisitorial system is traditionally under control of the judge, not the parties; he initiates the investigation and collects all the evidence.<sup>587</sup> The inquisitorial system places reliance on official documentation, a scientific paradigm for truth seeking, no lay juries but a career judiciary trained specifically for the bench, non-partisan state controlled procedure, and activist judges who intervene to ensure a solution based on the merits of the case.<sup>588</sup>

#### 4.1.2 The pre-trial stage of accusatorial and inquisitorial proceedings

The distinction between the accusatorial system and the inquisitorial system is not that apparent during the pre-trial stage, because in both systems, pre-trial investigative proceedings generally tend to be inquisitorial in nature. In accusatorial systems, the investigation of crime and collection of evidence is generally in the hands of the police, and the prosecutor only

<sup>584</sup> GL Certoma 'The Accusatory System v The Inquisitorial System: Procedural Truth v Fact?' (1982) 56 *Australian Law Journal* 288

<sup>585</sup> The jury trial was abolished in South Africa by the Abolition of Juries Act 34 of 1969

<sup>586</sup> F Strier 'What can the American adversary system learn from an inquisitorial system of justice?' (1992) 76(3) *Judicature* 109

<sup>587</sup> Certoma at 288. According to Italian and German law the prosecutor is in charge of investigations (see paragraph 4.1.2 *infra*).

<sup>588</sup> Strier at 109

participates in the investigation in relatively few cases.<sup>589</sup> In contrast, according to French law, an independent judge, the *juge d'instruction*, has to investigate cases involving more serious offences. In practice, however, when a crime is reported, the police generally conduct the investigation and only when the investigation is concluded to the satisfaction of the police do they pass the file on to the prosecutor. The prosecutor then formally decides whether to dismiss the case, to charge the suspect with an offence of lesser seriousness in the *tribunal correctionnel*, or to ask the *juge d'instruction* to open a formal investigation.<sup>590</sup> The judge is empowered to delegate investigations to the police and in practice almost always does so. Thus in France, most of the investigative work is done by the police.<sup>591</sup> Similarly, in Germany, the Code of Criminal Procedure states that the public prosecutor is formally in charge of criminal investigations.<sup>592</sup> In reality, though, the police have primary control over pre-trial investigations. While the German Code of Criminal Procedure empowers the prosecutor to ask for police assistance, generally complaints are received directly by the police, who conduct most investigations on their own initiative, without substantive guidance and mostly without the prosecutor's knowledge.<sup>593</sup> Italy, with the adoption of a new Penal Procedure Code in 1988, recognised the desirability of separating the trial judge from the act of gathering evidence. Investigations are now expressly delegated to the prosecutor and, under his

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<sup>589</sup> Herrmann (1981) at 59. For example, in South Africa it is the task of the police to investigate a complaint or a charge. The investigating officer opens a docket and gathers evidence, and in the past, handed the docket over to the Attorney-General who decided whether a prosecution can be instituted on the basis of the facts in the docket. Since the passing of the National Prosecuting Authority Act 32 of 1998, a new functionary, the Director of Public Prosecutions, has taken over the role previously assumed by the Attorney-General. In England, the Director of Public Prosecutions is not concerned with the investigations at all.

<sup>590</sup> T Weigend 'Continental Cures for American Ailments: European Criminal Procedure as a Model for Law Reform' in *Crime and Justice: An Annual Review of Research* (1980) 2 Morris, Norval and Tonry (eds.) 381 at 389-390. Under French law, a case can be sent to the *juge d'instruction* only by the prosecutor, not directly by the police.

<sup>591</sup> Herrmann (1981) at 59

<sup>592</sup> Section 160 paragraph 1 of the Code (see Weigend at 395). The German Code of Criminal Procedure requires the prosecutor to investigate not only facts inculcating the defendant, but also circumstances exonerating him (section 160 par. 2). Only if the prosecutor finds, after an impartial and independent investigation that there is "sufficient cause for filing a public accusation" (section 170 par. 1) is he to bring charges against the suspect.

<sup>593</sup> Weigend at 395. In virtually all countries following the inquisitorial model, the police usually conduct the actual investigation in terms of interviewing witnesses, interrogating suspects, and gathering physical evidence (see G Van Kessel 'Adversary Excesses in the American Criminal Trial' (1992) 67 *Notre Dame Law Review* 403 at 421)

direction, the judicial police.<sup>594</sup> The admissibility of testimonial evidence acquired by the police without prosecutorial supervision is quite limited under the code.<sup>595</sup>

#### 4.1.2.1 The protection of the rights of the accused during the pre-trial stage

Protection of the rights of the accused and other persons against police misconduct during pre-trial proceedings varies from country to country. Two different methods may be distinguished: (1) bureaucratic and judicial supervision and (2) exclusion of illegally obtained evidence. The first method is commonly used in civil law countries, with differing degrees of success,<sup>596</sup> while the second method became widely used in the United States after the Supreme Court started resorting to this method in order to restrict illegal conduct by the police.<sup>597</sup> It cannot be argued that exclusionary rules are typical of the Anglo-American system, since English courts have always held that, with the exception of involuntary confessions, all relevant evidence is admissible, and that the exclusion of illegally obtained evidence is at the discretion of the judge.<sup>598</sup> South Africa had previously tended to follow the English rule: the South African Criminal Procedure Act 51 of 1977 expressly provides in two instances that evidence is to be admitted even though it was illegally obtained.<sup>599</sup> Section 35(5) of the Constitution of the

<sup>594</sup> LJ Fassler 'The Italian Penal Procedure Code: An Adversarial System of Criminal Procedure in Continental Europe' (1991) *Columbia Journal of Transnational Law* 245 at 251-252. A newly created protagonist, the preliminary investigation judge, oversees the development of the investigation.

<sup>595</sup> Fassler at 254

<sup>596</sup> Herrmann (1981) at 59. Bureaucratic control is considered efficient in Germany, where police forces are hierarchically organised at state level and complaints against misconduct of officers may entail disciplinary and even criminal sanctions. In France, provision is made for judicial control of police misconduct in the *Code de Procédure Pénal*, but this procedure is not generally used. Inter-office complaints against misconduct of police officers do not work very efficiently.

<sup>597</sup> The first in a long line of cases was *Mapp v Ohio* (1961) 367 US 643, which excluded evidence obtained by unreasonable search and seizure (cited in Herrmann (1981) at 60).

<sup>598</sup> Herrmann (1981) at 60. This approach was also followed by South African courts which were required to refer to English common law in force on the 30<sup>th</sup> May 1961, with respect to the admissibility of unlawfully obtained evidence (section 252 of the Criminal Procedure Act 51 of 1977; see also paragraph 2.5.1 supra).

<sup>599</sup> Section 218 determines that facts discovered in consequence of an inadmissible confession are admissible. In *R v Samhando* 1943 AD 608, which dealt with the admissibility of pointing out, established the theory of confirmation by subsequently discovered facts, whereby facts discovered during an inadmissible confession or admission, become admissible. Subsequently in *S v Sheehama* 1991 (2) SA 860 (A), the court held that only facts discovered via a voluntary pointing out could be admitted. In *S v January* 1994 (2) SACR 801 (A), the confirmation theory as stated in *Samhando* was finally overruled by the Appellate Division. See also *S v Hoho* 1999 (2) SACR 159 (C) at 162d-j with reference to the decision in *S v January*. Section 225(2) of the Criminal Procedure Act states that evidence of fingerprints, other prints or bodily appearance taken or ascertained against the will of the accused is admissible. In *Ex parte Minister of Justice: In re R v Matemba* 1925 TPD 491 the court considered the admissibility of a palm-print taken by compulsion, and finding that the privilege against self-incrimination applied only to testimonial utterances, admitted the palm-print into evidence. In *S v Huma* (2) 1995 (2) SACR 407 (W) the court held that the taking of fingerprints did not infringe on the dignity

Republic of South Africa<sup>600</sup> now provides that evidence obtained in any manner which violates any right in the Bill of Rights, must be excluded if the admission of that evidence would render the trial unfair or otherwise be detrimental to the administration of justice.<sup>601</sup>

The absence of a lay jury in inquisitorial proceedings removes the need for most exclusionary evidence rules. Hearsay, opinion, character evidence, and evidence of prior convictions (in criminal cases) must all be admitted unless better evidence is available. In inquisitorial proceedings no evidence is automatically excluded. Factors which would affect admissibility of evidence in accusatorial proceedings, merely affect the weight of such evidence in inquisitorial proceedings.<sup>602</sup>

However, some exclusionary rules do exist in inquisitorial systems, for example, the French code of Criminal Procedure provides for the exclusion of illegally received evidence under some narrowly defined conditions. The German Code of Criminal Procedure prohibits the use of evidence obtained from an accused or a witness through unlawful methods such as *inter alia* ill-treatment, fatigue or physical abuse, drugs, torture, deception, or illegal threats or promises. In addition German courts have excluded evidence in a few cases that involved a serious violation of constitutional standards.<sup>603</sup> Italy's Penal Procedure Code expressly provides that evidence acquired in violation of prohibitions established by law cannot be utilised.<sup>604</sup>

Both procedural systems have advantages and both have defects. However, in general the accusatorial system seems to be more sensitive to the liberty of the citizen, while the inquisitorial system places more emphasis on ensuring the punishment of a guilty party. It is clear that a zealous pursuit of the inquisitorial approach would erode the freedom of the citizen. It is the delicate balance that exists between the discovery of facts at any cost, on the

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of a person, nor was fingerprint evidence testimonial evidence and thus was not in conflict with the privilege against self-incrimination (at 419g). This approach was also confirmed in *S v Maphumulo* 1996 (2) BCLR 167 (N) and *Msoni v Attorney-General, Natal* 1996 (8) BCLR 1109 (W).

<sup>600</sup> Act 108 of 1996

<sup>601</sup> The interpretation of section 35(5) has been considered in several cases, for example, *S v Naidoo* 1998 (1) BCLR 46 (D); *S v Madiba* 1998 (1) BCLR 38 (D); *S v Mphala* 1998 (4) BCLR 494 (W); *S v Soci* 1998 (3) BCLR 376 (E); *S v Kidson* 1999 (1) SACR 338 (W). See paragraph 2.5 *supra* for a discussion of these cases and the admissibility of unconstitutionally obtained evidence in general.

<sup>602</sup> Strier at 109

<sup>603</sup> Herrmann (1981) at 60

<sup>604</sup> Fassler at 255. Though exclusionary rules are not completely new to Italian procedure, the codified exclusionary rule in the Penal Code is firmer and more expansive than previous norms.

one hand, and considerations regarding basic and fundamental rights of the citizen on the other hand, that explains why a pure inquisitorial or accusatorial system is generally not found.<sup>605</sup>

### 4.1.3 The function of the various parties during the trial

The special qualities of the two models are best observed at the trial stage. The accusatorial trial is party-centred: the parties present their case to the judge (or the jury, if it is a jury trial). To prepare for the trial, both the prosecution and the defence have to collect their own evidence. The adversary trial proceeds from the idea that each party knows what is necessary to win its case. The state simply provides a forum, provided over by the judge, who acts as an arbiter supervising the contest of the parties.<sup>606</sup> The parties are entitled to limit the issues of the contest by means of pleadings, plea-bargaining, and admissions. They decide the order in which the evidence will be presented to the court and they interrogate the witnesses. Since the accused is a party to the contest, neither the prosecution nor the judge has a right to put questions to him as long as he wishes not to testify.<sup>607</sup>

#### 4.1.3.1 The function of the judicial officer

Trials that follow the inquisitorial model are judge-centred: it is the judge who calls and interrogates the witnesses and decides the order in which the evidence is presented. As almost all the questioning of witnesses is done by the judge, the distinction between examination-in-chief and cross-examination is unknown. Questions to test the reliability of a witness and the accuracy of his statements are put by the judge in the course of his comprehensive interrogation. The judicial enquiry into the facts also includes the questioning of the accused. He is interrogated by the judge because he is considered to be a valuable source of information. Since it is the judge's duty to ascertain all relevant facts, neither the prosecution nor the defence is under a legal burden of proof, though in practice the defence sometimes may have a duty to produce some evidence.<sup>608</sup> Judicial interrogation at the beginning of the trial is typical

<sup>605</sup> Certoma at 288

<sup>606</sup> Herrmann (1981) states (at 61) that, in its pure form the adversary trial does not exist today. Major differences may be observed among trials of the various common law countries.

<sup>607</sup> J Herrmann 'Various models of criminal proceedings' (1978) 2 *South African Journal of Criminal Law and Criminology* 3 at 4-5

<sup>608</sup> Herrmann (1978) at 5-6.

of the inquisitorial model. To hear the accused first is considered to be a privilege since he is offered an opportunity to present his version of the events before the other evidence is taken. The privilege more often turns out to be a burden, since the accused is in essence defending himself against a charge that is not yet proven. At the same time the judge will use the interrogation not only to afford the accused the opportunity to present his defence, but also to get as much information from the accused as possible.<sup>609</sup>

The judge's role at the adversary trial is mainly passive: he has to listen to the evidence presented to him and hear the arguments of the parties. However, he is not compelled to be totally inactive, since he may rule on the admissibility of evidence and on the propriety of the conduct of the parties. He also has the right to put supplementary questions to witnesses and to call witnesses that were not called by either of the parties.<sup>610</sup> In the various jurisdictions that follow the adversarial procedure, the judge exercises his role in different ways. For example, in most states of the United States, the judge in jury trials is not allowed to comment on the weight or merits of the evidence, or on the credibility of the witnesses.<sup>611</sup> This prohibition exists so as not to give the jury the impression that he leans towards one side or the other, that is, that he is not being unbiased.<sup>612</sup>

In South Africa, the pendulum swung towards the inquisitorial model with the adoption of section 115 of the Criminal Procedure Act 51 of 1977, which provides for judicial interrogation. According to this section, at summary trials where the accused pleads not guilty, the judicial officer may ask him whether he wishes to make a statement indicating the basis of his defence and which allegations in the charge he is willing to admit. Such questioning by the judicial officer at the beginning of the trial is supposed to help exclude irrelevant matters and thus shorten the duration of the trial. The questioning by the court should not go beyond the matters in issue, and should only be limited to those issues in respect of which the accused's

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<sup>609</sup> Herrmann (1978) at 12

<sup>610</sup> In the United States, trial judges technically retain the power to call and question witnesses not called by the parties (by virtue of Rule 614 of the Federal Rules of Evidence), but this power is used sparingly and is often discouraged by reversals of decisions (see Van Kessel at 429).

<sup>611</sup> Van Kessel at 430. Even in Federal courts where there is no direct prohibition on judicial summary or comment, judges use their common law discretionary powers very sparingly in view of the lack of explicit statutory authority, as well as the controversial nature and unclear boundaries of such authority.

<sup>612</sup> Herrmann (1978) at 7-9. The result of this prohibition is that the American judge is forced to remain cautious throughout the trial, in order to ensure that none of his statements or questions or even the intonation of his voice might unduly influence the jury.

statement is unclear and which require clarification. To go beyond that would create material for possible later cross-examination, and therefore it is not permissible.<sup>613</sup> In *S v Molelekeng*<sup>614</sup> a conviction and sentence was set aside where the questioning by the court bordered on cross-examination and seriously prejudiced the accused. Ordinarily, the accused will not be familiar with the technicalities of pleading to a charge, and will not always be assisted by a legal representative. The presiding officer should make it clear to the accused that the explanation of plea is not evidence under oath and thus not evidential material on which a conviction can be based.<sup>615</sup> In *S v Mungoni*<sup>616</sup> it was held that failure by a magistrate to explain to an accused that his statement under section 115 has no evidential value unless repeated under oath, amounted to an irregularity that rendered the trial unfair.<sup>617</sup> An accused must also be advised of his right to remain silent and is not obliged to answer any questions put to him under section 115. In *S v Shikongo and others*<sup>618</sup> the court held that a judicial officer was only obliged to give the necessary warning regarding the right to remain silent, as well as the explanation about the operation of section 115, after it becomes clear what the accused was going to plea.<sup>619</sup> In terms of section 112 of the Criminal Procedure Act, the accused may also be questioned by the judicial officer after entering a plea of guilty. This section is aimed at protecting the accused, but it has been held that the court should also advise the accused of his right to silence.<sup>620</sup>

A comparison of the American and English practice creates the impression that the American judge – even in jurisdictions where it is permissible that he comment on the evidence – feels less free to do so, and behaves in a less active way than his English counterpart. In England the power of the judge to control the trial and to actively participate in exploring the facts, has never been disputed.<sup>621</sup> Sometimes the pendulum seems to have swung too far in that direction

<sup>613</sup> See T Geldenhuys and JJ Joubert (eds.) *Criminal Procedure Handbook* (1996) at 188 and *S v Msibi* 1992 (2) SACR 441 (W)

<sup>614</sup> 1992 (1) SACR 604 (T)

<sup>615</sup> See *S v October* 1991 (1) SACR 455 (C)

<sup>616</sup> 1997 (8) BCLR 1083 (V)

<sup>617</sup> At 1084F. In this case the accused had clearly not understood the magistrate's earlier explanation regarding the operation of a section 115 statement.

<sup>618</sup> 2000 (1) SACR 190 (NmS)

<sup>619</sup> At 199g-h. This case involved the application of section 119 of the Criminal Procedure Act, where the accused is asked to plead in the magistrate's court on a plea justiciable in the High Court, and the accused pleads not guilty.

<sup>620</sup> See *S v Maseko* 1996 (2) SACR 91 (W)

<sup>621</sup> English judges are not only empowered, but are also obligated, to provide the jury with "a succinct but accurate summary of the issues of fact as to which a decision is required, a correct but concise summary of the evidence and arguments on both sides, and a correct statement of the inferences which the jurors are entitled to

since, on occasion, appellate courts have held that a judge had been too active, or in other words, too inquisitorial.<sup>622</sup> According to South African law, section 167 of the Criminal Procedure Act<sup>623</sup> empowers the court to recall and re-examine witnesses if such evidence appears to the court to be essential to the just decision of the case.<sup>624</sup> In *S v Van den Berg*<sup>625</sup> it was held that the court has a duty to exercise the power to recall a witness where it is necessary to attempt to discover the truth in order that substantial justice is done between the parties. The approach in the *Van der Berg* case was endorsed in *S v Ngcobo*<sup>626</sup> where the accused appealed against the extent of judicial questioning in the court *a quo*. On appeal the court held that the judicial questioning had been necessary due to the inept preparation and prosecution of the case by the State.<sup>627</sup> The court in *Ngcobo* held<sup>628</sup> that the words of section 167 were peremptory, and that a judge is bound to exercise his power of calling and examining a witness in a criminal case if that evidence seems to be essential to the just decision of the case.<sup>629</sup> In *S v Phallo and others*<sup>630</sup> the accuseds' appeal was based *inter alia* on extensive questioning by one of the assessors. In the *Phallo* case<sup>631</sup> and subsequently in the case of *S v Thusi and others*<sup>632</sup> the approach and principles regarding questioning by the presiding officer as set out in *S v Rall*<sup>633</sup> were favourably referred to. These principles may be distilled into the following points.<sup>634</sup>

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draw from their particular conclusions about the primary facts." (*R v Lawrence* 73 Crim App 1 (1981) at 5 cited in *Van Kessel* at 434).

<sup>622</sup> In a famous dictum, the Court of Appeal in *Yuill v Yuill* (1954) 1 All ER 183 at 189, stated that "a judge who himself conducts the examination... so to speak descends into the arena and is liable to have his vision clouded by the dust of the conflict. Unconsciously he deprives himself of the advantage of calm and dispassionate observation."

<sup>623</sup> Act 51 of 1977

<sup>624</sup> The presiding officer in South African trial is entitled to put questions during the trial to clarify an issue, but in general it is considered undesirable that he should participate extensively in the questioning of a witness and, so to speak, descend into the arena (See, for example, *R v Roopsingh* 1956 (4) SA 509 (A) and *S v Adriantos* 1965 (3) SA 436 (A)).

<sup>625</sup> 1995 (4) BCLR 479 (Nm)

<sup>626</sup> 1999 (3) BCLR 298 (N)

<sup>627</sup> At 298E-F

<sup>628</sup> At 302F

<sup>629</sup> An interesting contention by the appellant in the *Ngcobo* case, was that the Constitution required that all criminal procedural systems be accusatorial. This was rejected by the court. The court held (at 305I-J) that there were no positive provisions to that effect in the Constitution, and in the absence of such provisions, section 167 plainly envisages a partly inquisitorial approach by a court in the criminal justice procedure.

<sup>630</sup> 1998 (3) BCLR 352 (B)

<sup>631</sup> At 357E-358G

<sup>632</sup> 2000 (4) BCLR 433 (N) at 435D-H. In the *Thusi* case the appellant complained that the magistrate had descended into the arena and had exceeded the bounds of judicial questioning.

<sup>633</sup> 1982 (1) SA 828 (A)

<sup>634</sup> See *S v Phallo* at 357E where the court refers to *inter alia* *S v Maseko* 1990 (1) SACR 107 (A) and *Gerbers v S* [1997] (3) All SA 61 (A)

- (1) The main function of the court is to see that justice is done, and the rules of procedure may sometimes be regarded as peripheral to that objective.
- (2) The court may be obliged to put additional questions to witnesses (including the accused) in the interests of justice. Members of the court may put leading questions to the accused.
- (3) It is necessary for the court putting questions to ensure that justice is not only done, but also seen to be done.
- (4) The court must therefore conduct the trial in a manner which will demonstrate the open-mindedness, impartiality and fairness of the court.
- (5) Questions put by the court must not give the impression that the credibility of a witness or the cogency of his evidence has already been determined by the court.
- (6) The presiding officer must refrain from indulging in questioning witnesses in such a way or to such an extent that it may preclude him from detachedly or objectively appreciating and adjudicating upon the issues before him.

In England, as well as the United States it is left to the discretion of the judge to decide to what extent he participates in ascertaining the facts. In neither country is he under a legal duty to search for the truth.<sup>635</sup> Contrast this to the situation in South Africa, where section 186 of the Criminal Procedure Act provides that the court 'shall' subpoena and examine any person if his evidence appears to the court essential to the just decision of the case.<sup>636</sup> Section 186 is not that different from the corresponding provision of the German Code of Criminal Procedure, a code that represents the inquisitorial model. Section 244(2) of the German Code of Criminal Procedure reads: "In order to search out the truth the court shall on its own motion extend the taking of evidence to all facts and means of proof that are important for the decision".<sup>637</sup>

<sup>635</sup> Herrmann (1978) at 8. Some courts in the United States have stated that the judge has a duty to elicit those facts he deems necessary for the just decision of the case, but so far no appellate court has held a breach of that duty to be cause for reversing a judgement. See *Pariser v City of New York* 146 F2d 431 (2<sup>nd</sup> Cir 1945); *United States v Brandt* 196 F2d 653 (2<sup>nd</sup> Cir 1952).

<sup>636</sup> Hoffmann and Zeffert submit (at 471-474) that this section introduces an inquisitorial element into the basically accusatorial criminal procedural system of South Africa. Courts were at first reluctant to concede that section 186 had made a major change in the function of the judge. In *R v Hepworth* 1928 AD 265 the Appellate Division came down in favour of the section being given its literal meaning. Thus, the presentation of evidence is generally left to the parties, but if the judge considers that the material before him is not sufficient to allow him to arrive at the truth, he may pursue the investigation himself. In *S v B* 1980 (2) SA 946 (A) it was held (at 953) to be an irregularity where the court fails to call a witness whose evidence is essential for the just decision of a case.

<sup>637</sup> See Herrmann (1978) at 8, who points out that the French Code of Criminal Procedure sounds less inquisitorial than South African law. Article 310 of the French Code provides that in jury trials the presiding judge is vested with discretionary powers by virtue of which he may, on his honour and conscience, take all measures that he believes useful for the discovery of the truth. The author states that there is no doubt, however,

Thus, the trial judge not only has to ascertain the facts of the case; he must also decide what the law is and he must apply the law to the facts. It can be argued in favour of the inquisitorial system that the judge who has to decide the case knows best what information he needs and what questions should be put to the accused and to the witnesses. By conducting the interrogation himself he can obtain this information first-hand, while the judge in an adversary trial has to be satisfied with the information presented to him by the parties. Thus, the judge who undertakes the main questioning himself may not run the same risk of obtaining one-sided information, as the judge in the adversarial trial might. On the other hand, it must be taken into consideration that in the inquisitorial system the judge has to do three jobs at the same time: he has to conduct the examination-in-chief, he has to conduct the cross-examination, and he has to assess the evidence. In assessing the evidence, he may have to decide on the efficiency of his own questioning. There is the danger that the judge might be psychologically overburdened by these disparate tasks.<sup>638</sup> Proponents of the adversary trial thus often question the objectivity of the judge in inquisitorial systems. A judge, who prior to the trial studies the case file developed by the police and prosecutor, or by the investigating magistrate, may tend to reach a conclusion at an early stage and remain impervious to contradictory evidence later developed at trial.<sup>639</sup>

#### 4.1.3.2 The role of the prosecutor and defence lawyers

In *Smyth v Ushewokunze and Another*<sup>640</sup> the court outlined the expectations that society has from a prosecutor.<sup>641</sup> The court held that a prosecutor must dedicate himself to the achievement of justice and pursue that aim impartially. Since he represents the State, the community at large and the interests of justice in general, the task of the prosecutor is more comprehensive and demanding than that of the defending practitioner. He must produce all

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that the French judge, like all other judges in the inquisitorial systems, is under a duty to search for the truth. The old *Code d'Instruction Criminelle*, which was replaced by the present code in 1959 had stated that duty in more express terms.

<sup>638</sup> Herrmann (1978) at 12-13. Research on the technical problems of an interview has revealed that an interviewer may influence the answers he receives by his personality, by the social and professional role he plays, by the order of his questions, and by the way he phrases the questions. Even though an interviewer has to remain impartial, he subconsciously tends to seek out information which supports his hypothesis.

<sup>639</sup> Van Kessel at 517

<sup>640</sup> 1998 (2) BCLR 170 (ZS)

<sup>641</sup> At 174F-175C

relevant evidence to the court and ensure, as best he can, the veracity of such evidence. If he knows of a point in favour of the accused, he must bring it out. The duty of the prosecutor to place before the court all material essential for the investigation of the truth, is justified on the ground that the prosecution has all the resources of the State, including finances, the police and vital information, at its disposal. Referring to *Boucher v The Queen*<sup>642</sup> the court in *Smyth* stated that the purpose of a criminal prosecution is not to obtain a conviction and that the role of the prosecutor should exclude any notion of winning or losing.<sup>643</sup>

The reality in adversary trials, however, is that the lawyers often dominate and control the trial.<sup>644</sup> Such a trial then becomes a contest with the aim being 'winning the case' regardless of whether the outcome of the case is in accordance with truth and real justice.<sup>645</sup> American trial lawyers are seen to be generally more aggressive than English (and certainly Continental) advocates.<sup>646</sup> The Anglo-American systems put great faith in the device of cross-examination and it is regarded as the perfect method of establishing the truth.<sup>647</sup> However, the effective cross-examiner is often the one who knows which question not to ask, which witnesses to call (or not to call) and in which order, which documents to produce and how to use a document during cross-examination to obtain the results that will favour his case.<sup>648</sup>

<sup>642</sup> [1955] 110 CCC 263 (Supreme Court of Canada) at 270

<sup>643</sup> *Smyth v Ushewokunze* at 175D-E

<sup>644</sup> See ME Frankel 'The Search for Truth: An Umpireal View' (1974) 123 *University of Pennsylvania Law Review* 1031. According to Frankel (at 1038), the American courts "wait passively for what the parties will present, almost never knowing – often not suspecting – what the parties have chosen not to present."

<sup>645</sup> SA Saltzburg 'Lawyers, Clients and the Adversary System' (1986) 37 *Mercer Law Review* 647 states (at 654) that litigants pursue victory rather than truth and the adversary system's rules often operate to frustrate truth discovery. See also JR Du Plessis 'The Accusatorial System – Too Much a Game?' (1991) 108 *South African Law Journal* 577, who states that the paramount duty of a public prosecutor is not to obtain a conviction but to assist the court in ascertaining the truth. Yet, it is not unusual for prosecutors to adopt the approach complained of by the court in *S v Jija & others* 1991 (2) SA 52 (E). In that case, the court made the point (at 67I-68B) that counsel for the State had seemed to adopt the approach of a practitioner representing a client, rather than that of a public prosecutor. Du Plessis is of the opinion that such behaviour by a prosecutor is unavoidable due to our accusatorial system of criminal procedure, which results in a criminal trial becoming a game of skill between prosecution and defence (at 577).

<sup>646</sup> Van Kessel at 434-435. In English trials, the judicial summary at the end of the case, takes the place of the prosecutor's closing argument in the United States. Van Kessel refers (at 434) to the prosecutor's closing argument as "a partisan presentation which is probably the most powerful tool in the prosecutors trial arsenal." Ethical rules prevent English barristers from interviewing witnesses, thereby guarding against the danger of counsel drilling or coaching his witnesses. Barristers are also more restricted than their American counterparts in approaching witnesses during questioning and other movements about the courtroom. In South Africa the traditional division between advocates and attorneys was recently eliminated and attorneys are now also permitted to appear in the High Court on behalf of their clients.

<sup>647</sup> McEwan at 16. Cross examination has been described as "the greatest legal engine ever invented for the discovery of the truth" (Wigmore *Evidence* 3ed Vol 5 par 1367 cited in Snyman at 109)

<sup>648</sup> Du Plessis at 578.

In contrast with the adversary trial, the prosecution and the defence play comparatively minor roles during the inquisitorial trial. After the judge has finished the examination of a witness, or of the accused, the prosecutor or defence counsel may suggest that the judge put additional questions or they may request leave to ask supplementary questions themselves.<sup>649</sup> They may also suggest that the judge take further evidence. After all the evidence is heard they have a right to address the court. While adversary systems can be distinguished from one another by looking at the role of the judge, differences in inquisitorial proceedings may be demonstrated by asking what functions the prosecution and the defence exercise in the course of the trial. For example, in German procedure the judge, having finished the interrogation of a witness, must give the prosecution and the defence an opportunity to put additional questions or to comment.<sup>650</sup> In French trials before a *cour d'assises* the danger that questions by the prosecution or the defence might confuse the lay judges and thus interfere with the fact-finding process, is taken so seriously that the questioning of the witnesses is done solely by the presiding judge. The prosecution and the defence have to put any questions they may want to ask a witness through the judge.<sup>651</sup> Contrary to the adversarial model, the defence counsel in inquisitorial proceedings is generally entitled to full discovery of the files of the prosecution prior to the trial. Exception is made only if inspection could endanger further investigation.<sup>652</sup>

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<sup>649</sup> The system of cross-examination is unknown in inquisitorial procedure, and regarded by proponents of that system as a method by which the most honest witnesses can be driven or twisted into contradicting himself (see Snyman at 109). McEwan states (at 16) that cross-examination is frequently used to confuse witnesses, to get them to contradict themselves, showing their unreliability. Especially in cases where there are many documents handed in as evidence, this can easily be done when a witness is asked to explain entries about which he often remembers very little.

<sup>650</sup> Herrmann (1978) at 8-9. These provisions are found in sections 240(2) and 257 of the German Code. A 1975 amendment to the German Code of Criminal Procedure provides that a witness below the age of sixteen years shall be examined solely by the judge. If the prosecution or defence wish to ask any additional questions they may do so only through the judge (section 214a). This amendment took an adversary element out of German procedure in order to protect not only juveniles, but also the fact-finding process against the danger of improper questions.

<sup>651</sup> Herrmann (1978) at 9. Previously the prosecutor was permitted to question a witness directly, but this was changed in 1972, to put him on par with the defence (section 312 of the French Code of Criminal Procedure).

<sup>652</sup> Van Kessel at 422. In South Africa, the 'blanket docket privilege' in terms of which statements obtained for the purposes of a criminal trial were as a rule privileged from disclosure, was found to be in conflict with sections 23 and 25(3) of the interim Constitution (Act 200 of 1993) in the case of *Shabalala v Attorney-General of Transvaal and others* 1995 (2) SACR 761 (CC). The power to decide whether the accused has a right to statements held by the police belongs to the court. It has to make a decision based on the accused's right to a fair trial (now contained in section 35(3) of the Constitution Act 108 of 1996) – see Schwikkard *et al* at 139.

## 4.2 Procedural systems, fact finding and evaluation of evidence

Both the accusatorial and the inquisitorial systems as they exist today are the consequences of historical growth and political developments. They are not the result of scientific enquiry into which of the two models is better equipped at fact finding.<sup>653</sup>

The operative principle with regard to the admission and evaluation of evidence in criminal trials following a predominantly inquisitorial model, is the free evaluation of evidence, or 'free proof'.<sup>654</sup> This principle not only constitutes a freedom in favour of the judge to apply his prudent judgement to the facts of the case, but also is an advantage operating in favour of the accused, in knowing that the judge will not be restricted in his evaluation of the facts. Thus, the principle of free evaluation of evidence means in substance: (1) full freedom to admit evidence, (2) the right to enquire into atypical forms of evidence, that is, forms of evidence not considered by law to be desirable, such as the police file, and (3) free evaluation of evidence.<sup>655</sup>

In the system of 'legal proof', by way of contrast, the law rigidly determines the evidence to be admitted and the weight it must be given. The existence of exclusionary rules supports the doctrine of legal guilt as espoused by Packer.<sup>656</sup>

"... a person is not to be held guilty of a crime merely on showing that in all probability, based on reliable evidence, he did factually what he is said to have done. Instead, he is to be held

<sup>653</sup> See Herrmann (1978) at 12, who describes the inquisitorial procedure as a quasi-scientific search for the truth, rather than a dispute. The judge collects and analyses all the evidence and tries to draw an objective and comprehensive picture of the circumstances of the alleged offence by integrating the arguments and evidence of the prosecution and the defence. In adversary proceedings, on the other hand, each party tries to prove its case in an independent way and tries to destroy the case presented by the other party by pointing out its weaknesses. Thus, both parties constantly attempt to demonstrate to the judge that alternative answers can be given to the charge.

<sup>654</sup> This principle means that the judge may weigh the evidence, freely and in accordance with his prudent judgement. The principle of free evaluation of evidence has its origins in the French Revolution, which exploited the institution of the jury. Traditionally, the jury gave an unreasoned verdict reached on the basis of an 'intimate conviction' of the facts presented to it (see Certoma at 290).

<sup>655</sup> Certoma at 290. The Italian judiciary, prior to the enactment of the Italian Penal Procedure Code of 1988, having achieved this full and controlled power over evidence, often ignored any exclusionary rules contained in the previous Italian Code of Criminal Procedure. Taking the principle of free evaluation to its logical but extreme conclusion, the judges contended that even if the collection of certain evidence does not comply with certain procedures or other requirements prescribed by the *Code*, the court may nonetheless utilise the evidence, evaluate it, and convince itself of its probative value.

<sup>656</sup> HL Packer *The Limits of Criminal Sanction* (1968) at 166

guilty if and only if these factual determinations are made in a procedurally regular fashion and by authorities acting within their competencies duly allocated to them.”

The result is that the final verdict of the judge in an adversary trial cannot be described as reflecting the material or actual truth, but rather the so-called legal truth or formal truth.<sup>657</sup>

#### 4.2.1 Equality of arms, cross-examination and the expert witness

For effective and fair adjudication in the case of an adversary trial, an equality of arms is required.<sup>658</sup> The ability of the defence to challenge and test evidence put forward by the prosecution may become extremely onerous in the case of expert evidence. Cross-examination may become increasingly more difficult for the cross-examiner dealing with scientific evidence.<sup>659</sup> In order for the defence to effectively cross-examine the prosecution’s expert witness in an adversary trial, it should be possible for the defence to consult with its own expert, thereby making an informed evaluation of the strengths and weaknesses of the state’s case. To refuse the defence such resources would make a mockery of the right to a fair trial.<sup>660</sup>

Adversary procedures may also have the effect of preventing information critical to the determination of issues being aired. Since cross-examination is designed to highlight only those aspects of evidence that would suit the case of the cross-examiner, it could potentially distort the account of the evidence. The cross-examiner effectively has control over the witness in that he can terminate the cross-examination at any point, leaving the expert without an opportunity of explaining any distorted view that might have been created during cross-examination.<sup>661</sup> To combat a similar problem in Great Britain, the Royal Commission of Criminal Justice 1993 (Report (Cm 2263)) made the following recommendations:

<sup>657</sup> Snyman at 108

<sup>658</sup> See generally JS Silver ‘Equality of arms and the adversarial process: A new constitutional right’ (1990) *Wisconsin Law Review* 1007

<sup>659</sup> L Meintjies-Van der Walt ‘Shooting at science: expert evidence and equality of arms’ (1996) 9(3) *South African Journal of Criminal Justice* 361 at 362. The author submits that the state is not likely to call an expert witness if his testimony cannot further the case. Thus the opinion of the expert, (which by virtue of the adversary system will be biased), will be accepted as the uncontraverted view, unless contested.

<sup>660</sup> See Meintjies-Van der Walt at 361-362 who states that, “if the prosecution calls experts and the defence, because of lack of funds or other means, is not able to contest such evidence, the dice will be overwhelmingly loaded in favour of the state.”

<sup>661</sup> Meintjies-Van der Walt at 362-363

- (1) Where expert evidence is disputed, the trial judge should ask expert witnesses, before they leave the witness box, whether there is anything that they wish to say (recommendation 298).
- (2) Expert witnesses should also be able, through their counsel, on leaving the witness box, to indicate that they wish to clarify the evidence they have just given (recommendation 299).

Strier<sup>662</sup> is of the opinion that the American judicial system must address the increasingly evident limitations of the civil jury when dealing with expert witnesses. In addition to the so-called 'cognitive chaos' that trials present to many jurors, there are also the conflicting testimonies of party-called expert witnesses. These individuals are well compensated, sometimes on a contingency basis, rendering their testimonies commensurately suspect. Therefore, rather than merely evaluate the content of expert testimony – a task sufficiently daunting for the lay person – jurors must also consider the expert's motivation and credibility.<sup>663</sup>

In South Africa, the Supreme Court addressed the issue of expert evidence in the case of *S v Huma (2)*<sup>664</sup> where *pro deo* counsel acting for the defence made application for the assistance of a ballistic expert witness. The court in *Huma* stated that the purpose of an expert is not to further the cause of any particular party, but rather to assist the court in coming to a proper decision on technical and scientific matters.<sup>665</sup> The realities of the adversary system often are not in accord with such a statement. Expert evidence given on behalf of the prosecution under the guise of independence and neutrality serves only to perpetuate one of the problems associated with the adversary system. Accepting that the expert witness who introduces scientific evidence for the prosecution is, by virtue of being a scientist, naturally unbiased and objective can have dire consequences.<sup>666</sup> The English case of *Preece v HM Advocate*<sup>667</sup> seems

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<sup>662</sup> At 110

<sup>663</sup> The testimony of non-expert witnesses may present problems as well, since due to the highly biased questioning of the interrogating attorney, the answer of a witness may lose its validity. In addition, the testimony of party called witnesses is often unreliable due to factors such as witness coaching. Cross-examination may be inadequate to undo the effects of coaching, and may in itself introduce fresh distortion (see Strier at 110).

<sup>664</sup> 1995 (2) SACR 407 (W)

<sup>665</sup> At 410*h*. Claassen J warned (at 410*i*) that an expert witness who espouses the cause of his particular client to such an extent that he loses objectivity, in fact undermines his client's case, and risks his credibility becoming suspect.

<sup>666</sup> Meintjies-Van der Walt at 363. See also J Langbein 'The German advantage in Civil Procedure' (1985) 52 *University of Chicago Law Review* 823 at 833-849. Langbein submits that the more measured and impartial an

to show that scientists are sometimes anything but unbiased. In the *Preece* case the accused was found guilty of the rape and murder of a female hitchhiker. Tests on semen stains found on the victim's body and clothing indicated that the perpetrator was a blood group A secretor. A saliva swab from the accused indicated that he was a group A secretor as well. The expert witness in this case indicated that only 30% of the population fall into that blood group category. The evidence thus clearly favoured the prosecution. However, what the expert had failed to point out, was that the victim was also a blood group A secretor; a fact which if revealed would have thrown a completely different light on the scientific evidence.<sup>668</sup> The Australian case of *R v Chamberlain*<sup>669</sup> is another example of lack of impartiality of expert testimony. The Chamberlains were convicted of the murder of their baby daughter, who disappeared during a camping trip in central Australia. Mrs. Chamberlain claimed to have seen a dingo leaving the tent where the child was sleeping. Scientific analysis of stains found under the dashboard of the family's car led to the conclusion that they were minute amounts of blood. Mrs. Chamberlain was sentenced to life imprisonment and her husband to eight years' imprisonment. Three years after sentence, a Royal Commission<sup>670</sup> re-examined the evidence and the expert evidence in particular. It was found that there was a 'strong probability' that what the scientists had originally claimed to have been blood, was in fact a sound-deadening compound used in all models of the type of car that the Chamberlains owned. The Commission's report not only highlighted the imperfections of the scientific evidence, but also indicated<sup>671</sup> that some experts had abandoned impartiality to the detriment of the defence.

Expert evidence, such as ballistics and DNA evidence, often creates problems in the adversary trial when one considers the capacity of the defence to challenge expert evidence. The accused are often from the less affluent sectors of society and therefore in need of legal-aid defence counsel. In some cases, time and money constraints might compel defence lawyers to believe that any challenge to expert evidence would be futile, thus they may encourage their clients to

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expert is, the less likely he is to be used by either side. There are subtle pressures on expert witnesses to 'join the team' that is, to conceal doubt, to overstate nuance, to downplay weak aspects of the case the expert has been hired to bolster.

<sup>667</sup> [1981] *Criminal Law Reports* 783. See R Smith and B Wynne (eds.) *Expert Evidence: Interpreting science in the Law* (1991) 73-76 for a discussion of the *Preece* case.

<sup>668</sup> The testimony of the expert in this case, a Dr Clift, was described as "an unprecedented pollution of justice" (Fourth report of the Parliamentary Ombudsman (1983-84))

<sup>669</sup> No. 2 (1984) 153 CLR 521 (cited in Meintjies-Van der Walt at 364)

<sup>670</sup> *Royal Commission of Inquiry into Chamberlain Convictions Report* (Justice JR Morling) (1987)

<sup>671</sup> At 222

plead guilty.<sup>672</sup> It would be in the interests of the proper functioning of the adversarial system that each defendant has the necessary resources to challenge prosecution evidence.<sup>673</sup> However, this will not solve the effect of potentially partisan expert witnesses giving biased evidence. Another possible solution is the introduction of neutral court-appointed experts, who would either be called by the court to give evidence or act as special assessors for the evaluation of expert evidence.<sup>674</sup>

Strier<sup>675</sup> submits that the inquisitorial system's use of court-appointed expert witnesses, which are neutral, is a better option than the adversary system's use of party-called experts.<sup>676</sup> He thus suggests exclusive reliance on court-called expert witnesses, especially in the context of jury trials, so jurors would be spared the frustration of choosing whom to believe in the so-called the 'battle of the expert witnesses'.<sup>677</sup> In the United States, Rule 706 of the Federal rules of Evidence provides *inter alia*:

- '(a) *Appointment.* The court may on its own motion or on the motion of any party enter an order to show cause why expert witnesses should not be appointed, and may request the parties to submit nominations. The court may appoint any expert witnesses agreed on by the parties and may appoint expert witnesses of its own selection....
- (b) *Parties' Experts of Own Selection.* Nothing in this rule limits the parties in calling expert witnesses of their own selection.'

In practice, however, few parties have made applications under this rule; neither has the court done so *mero motu*. The reluctance of the court to call an expert of its own accord is due to the traditional respect that judges have for the litigants' strategies.<sup>678</sup> In terms of South African

<sup>672</sup> See Goodwin and Meintjies-Van der Walt at 169-170

<sup>673</sup> This requirement is also contained in section 35(3)(i) of the Constitution of the Republic of South Africa Act 108 of 1996, which states that every person has the right to a fair trial, which includes the right to adduce and challenge evidence.

<sup>674</sup> Goodwin and Meintjies-Van der Walt at 170. See also Meintjies-Van der Walt at 364.

<sup>675</sup> At 110-111 and 161-162

<sup>676</sup> In Italian criminal procedure, for example, experts are not so much regarded as witnesses, but as collaborators with the judge. Expert evidence is ordered by the examining judge to assist in scientific matters. The judge must resort to experts when the inquiry involves matters that are not in the normal cognitive powers of the judge. This obligation on the judge does not arise only in the case of a technical enquiry, but also in the case of a difficult inquiry which may require special knowledge (see Certoma at 290).

<sup>677</sup> See also Van Kessel (at 464) who describes experts who are paid by the parties as "hired guns totally committed to their part-employer." He is in favour of the German view of expert witnesses as "neutral assistants to the court, supplying it with technical knowledge not otherwise available to the judges themselves."

<sup>678</sup> Meintjies-Van der Walt (at 365), citing the American Bar association, Section of Litigation, *Emerging Problems under the Federal Rules of Evidence* (1983) 224

law, section 186 of the Criminal Procedure Act 1977 makes provision for the judge to call witnesses if these are considered “essential to the just decision of the case.” This section does not specifically deal with the court’s competence to call expert witnesses, but could in theory provide the court with such an opportunity. In addition, section 145 of the Criminal Procedure Act provides for the appointment of assessors by the court. Section 145(1)(b) states that “an assessor for the purposes of this section means a person who, in the opinion of the judge who presides at the trial, has experience in the administration of justice or skill in any matter which may be considered at trial.” This section could be interpreted as allowing the court to appoint expert assessors. An assessor who has expertise in the particular science and who is conversant with the methodology and terminology used by the expert witness could by additional questioning of the witness, assist in clarifying the issues in dispute.<sup>679</sup>

At first glance, it would seem as if the use of court-appointed witnesses could solve the financial constraints preventing defendants from acquiring expert evidence, and may also address the problem of additional costs not budgeted for, when *pro deo* counsel applies for the assistance of an expert.<sup>680</sup> However, experience in other jurisdictions indicates that court appointed experts in some cases may generate more expenses, as parties call further experts to either support or refute the opinion of the court-appointed expert.<sup>681</sup>

The Royal Commission on Criminal Justice<sup>682</sup> recommends the crystallisation of issues by way of pre-trial discussion. It further requires that the expert witnesses on both sides draw up a report of the scientific facts being relied upon and their interpretations thereof. This document should then be made available to the court as a written account of what facts have been agreed upon or remain in dispute.<sup>683</sup> In *S v Huma(2)*(supra) Claassens J commended the experts in that particular case to adopt the procedure used in civil cases, where the experts meet in advance of the trial so as to indicate where they agree and disagree. The court was of the

<sup>679</sup> Meintjies-Van der Walt at 366

<sup>680</sup> In *S v Huma (2)* (supra) the court pointed out (at 410b) that in a case where *pro deo* counsel was acting for the defence, care should be taken in granting an application for assistance of an expert witness by the defence, since the appointment of experts entails additional expenses which had not been budgeted for.

<sup>681</sup> In *In re Saxton* (1962) 1 WLR 968, Lord Denning stated (at 972) that litigants realise that the court would attach great weight to the report of a court expert. If the report were against one side, that side would wish to call its own expert to contradict the court expert’s evidence, and then the opposing side would probably wish to call an expert too.

<sup>682</sup> Report Cm 2263 (1993), Recommendation 287 (see supra)

<sup>683</sup> Recommendation 289

opinion that such co-operation between experts of opposing sides generally results in saving time and costs.<sup>684</sup> With reference to DNA evidence, Goodwin and Meintjies-Van der Walt<sup>685</sup> submit that the defence should be entitled to sufficient pre-trial disclosure not only of the DNA results but also of statements and records made by the expert regarding the procedure followed in a particular case. The authors refer to the Report of the Royal Commission of Criminal Justice<sup>686</sup> recommendation that: “where scientific evidence is in the hands of the prosecution and where a suspect has been charged and is legally represented ... the defence should have an enforceable right to observe any further scientific tests conducted on it or, unless the material exists only in minute quantities, the right to remove some of the material .... so that tests can be carried out by defence scientific experts.”

Meintjies-Van der Walt submits<sup>687</sup> that consideration should be given to experts’ reports being admitted into evidence, in addition to their *viva voce* evidence. The author is of the opinion that such reports, reflecting the full findings of the expert witness, would assist the fact-finding process. The court would have the opportunity to examine the written version of the expert’s evidence, affording time for reflection and consideration. Such written reports would also give the judge and assessors the opportunity to follow more readily the explanations given by the expert, facilitating easy reference, without the need to take down copious notes.<sup>688</sup>

Thus, although the adversary system is based on the assumption that both parties have equal opportunity to present their case, in practice they usually do not have the same financial resources to conduct litigation and call expert witnesses, nor are the skills of the opposing counsel necessarily equally matched. Rivalry introduced by the competitive approach to litigation in an adversary trial usually means that there will not be full disclosure of facts, especially those facts which could damage a party’s case.

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<sup>684</sup> At 410j-411a

<sup>685</sup> At 170

<sup>686</sup> 1993 (Cm2263) par 9.52

<sup>687</sup> At 366.

<sup>688</sup> Strier suggests (at 161) that the written opinion of the court-called expert should also be circulated to the trial’s attorneys, whose comments may lead the court either to hold a hearing where the attorneys can interrogate the expert or to get the opinion of a second expert. Witness expertise is thus kept impartial, while the opportunity remains for attorney confrontation and rebuttal to protect against error or whim.

## CHAPTER FIVE

### CONCLUDING REMARKS

Items of scientific evidence have no intrinsic value in isolation from the rest of the case. Evidence has value in context only. According to Robertson and Vignaux<sup>689</sup> the value of evidence depends on its ability to distinguish between two hypotheses. It is therefore important that both forensic scientists and legal practitioners consider all the appropriate alternative hypotheses in any given case. In a criminal trial, one hypothesis will generally be the prosecution case, while the alternative hypothesis will be the defence case.<sup>690</sup>

The legal system tends to ask how reliable evidence is. Yet, the word 'reliable' does not seem to have an exact meaning.<sup>691</sup> Sometimes it refers to the sensitivity of a technique, that is, whether the technique can be relied upon to produce usable results from the quality and quantity of material available for analysis.<sup>692</sup> At other times the question of reliability centres around the experimental procedures and quality control existing in a particular forensic laboratory.<sup>693</sup> Reliability can also refer to the discriminatory power of the evidence, and whether it can be used in a forensic setting to distinguish between individuals or only between relatively large classes of the population. Finally, reliability can refer to the scientist who carried out the procedure, and whether he had been truthful in relating the procedure followed, and truthful about his observations and inferences.<sup>694</sup>

As technology is advancing, various novel scientific techniques may be developed and the question arises which of these new techniques could be used in a forensic setting. An example

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<sup>689</sup> *Op cit* (1995) at 220

<sup>690</sup> See Goodwin (at 171-172) who points out that even if there is a high probability that, for example, a DNA sample at a crime scene came from a particular person, it does not necessarily mean that the person is guilty of the crime charged. Other reasons for the presence of the accused's DNA should be investigated and not be discounted.

<sup>691</sup> See generally Robertson and Vignaux (1995) at 7-8

<sup>692</sup> Consider, for example, the issues surrounding dissimilarities found between fingerprints lifted from a crime scene, and those taken from the suspect (paragraph 3.2.3 *supra*), as well as the possible sources of contamination or degradation of crime scene samples prior to DNA analysis (paragraph 3.1.2 *supra*).

<sup>693</sup> See, for example, the cases of *R v Tran* and *People v Castro* (paragraph 3.1.3 *supra*)

<sup>694</sup> The *Chamberlain* case and the case of *Preece v HM Advocate* (paragraph 4.2.1 *supra*) serve as examples of cases where expert witnesses either concealed certain facts deliberately or failed to consider alternative hypotheses, thereby making the evidence fit a certain hypothesis. See also the comments of Langbein (paragraph 4.2.1 *supra*) regarding the pressures exerted on the 'paid expert'.

of such evidence is the technique of capillary electrophoresis, which, although in use for 30 years as an analytical technique, was not accepted in courts in the United States as scientific evidence until 1996 in the case of *Tennessee v Ware*.<sup>695</sup> The use of computers in for example, clinical medical practice is on the increase. A balance will eventually have to be struck between the ease of admission of computer-produced documents as evidence, and the ability to prove the reliability and accuracy of the information produced.<sup>696</sup> Another area of concern is the chain of custody of tissue and blood samples used for forensic purposes. A laboratory conducting analysis of samples must be able to show that each sample was correctly labelled and must be able to account for the whereabouts of samples from the time they were received (or collected from a suspect), up to the time when the analysis was carried out.<sup>697</sup> In *S v Klaase*<sup>698</sup> for example, the expert witness during oral testimony misidentified the place where a thumbprint was found.<sup>699</sup> Despite this, the fact that the police reference number the expert had recorded on the evidence corresponded with the reference number for the correct location recorded by the police, led to the evidence being admitted and the subsequent conviction of the accused. Medical laboratory technologists routinely conduct analysis for medical purposes, however, in certain circumstances, the results may be needed at a later stage for legal purposes to prove a driver's Blood Alcohol Concentration (BAC). The technologist who took the blood and conducted the alcohol analysis will then be required to testify at the trial and his testimony is crucial to the prosecution of the case. In such as case, continuity must be established to link the blood sample and the results of its analysis to the accused person.<sup>700</sup>

It has been proposed that an ideal scientific identification system should contain the following

<sup>695</sup> 11 Judicial District 203757, Division 1 Crim Cr (1996). In the *Ware* case, DNA was extracted from hair and other tissues, amplified by PCR, and the sequenced product obtained from the suspect was compared to DNA specimens obtained from the crime scene, using capillary electrophoresis (see generally Marchi and Pasacreta (op cit supra))

<sup>696</sup> See generally I Cheong 'The legal acceptability of an electronic medical record' (1997) 26(1) *Australian Family Physician* 37. The author points out that an electronic medical record has not yet been tested in an Australian court. One of the concerns with such a document is the ease with which a computer-produced document may be deliberately falsified leaving no trace.

<sup>697</sup> See the discussion of section 212(8) of the Criminal Procedure Act in paragraph 2.2 supra, as well as the case of *R v Tran* (supra), where a suspected mix-up of samples occurred.

<sup>698</sup> 1998 (1) SACR 317 (C)

<sup>699</sup> The expert testified that he had lifted the thumbprint from a holiday house at 'De Hoop' while the housebreaking had actually occurred at a house called 'De Hoek'.

<sup>700</sup> See W Westerbrink 'The role of the Medical Laboratory Technologist in Drinking and Driving Cases- Part 2: The Use of Hospital Alcohol Results as Evidence and Providing testimony in Court' (1992) 54(4) *Canadian Journal of Medical Technology* 228 at 228-231. The author stresses the need for the technologists to clearly outline the methods used to take the blood samples, as well as methods of analysis employed.

characteristics.<sup>701</sup>

- 1) the ability to identify features unique to the individual
- 2) these features do not change over time
- 3) these features are unambiguous so that two experts would describe the same features the same way
- 4) the identification system can place the individual at the crime scene
- 5) the system is reasonably simple and cheap to operate

Robertson and Vignaux<sup>702</sup> submit that few systems will satisfy all the criteria and in particular there may be a trade off between the last requirement and the others. Both DNA-fingerprinting and 'conventional' fingerprinting satisfy the first and second criteria, but the complexity of the technique of DNA-fingerprinting and the high costs involved are always factors to be kept in mind. The third criterion would certainly put a question mark behind the techniques of polygraph testing, bite mark evidence and psychiatric evidence. Polygraph evidence depends almost entirely on the interpretation of the polygraph examiner and in addition, the features under consideration, namely, physiological responses to certain questions, have been shown to have many possible origins and therefore cannot be called unambiguous.<sup>703</sup> Similarly, psychiatric evidence often consists mainly of the subjective opinion of a psychiatrist or psychologist, based on statements made by an accused, and two experts will often interpret the same features differently. The lack of uniform standards with regard to bite mark evidence<sup>704</sup> would also make this type of evidence fall short of the third criterion.

Even a so-called exact science, such as DNA profiling, can sometimes fall short of the requirement for unambiguity. The increasing use of DNA evidence in South African courts will require that both scientists and lawyers remain conversant with the fundamental principles, as well as any new developments in forensic technology. In criminal cases in particular, DNA evidence can be an extremely powerful tool in proving or disproving the involvement of a suspect. According to Goodwin<sup>705</sup> the power of this technique in excluding or incriminating suspects makes it extremely important that those dealing with the generation and evaluation of

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<sup>701</sup> See Robertson and Vignaux (1995) at 6

<sup>702</sup> At 6

<sup>703</sup> See paragraph 3.3 *supra*

<sup>704</sup> As identified in paragraph 3.4 *supra*

<sup>705</sup> At 151-152

DNA profiling data have a sound understanding of the potential ramifications of the evidence. Judges and lawyers should thus not only be aware of the technical aspects of DNA profiling, but should also be conversant with the significance of all factors relevant to the evaluation of the data.<sup>706</sup>

Robertson and Vignaux<sup>707</sup> on the other hand, are of the opinion that an understanding of the logic of inferences is more important to lawyers than technical knowledge about scientific matters and that the most important point about expert evidence, is its correct interpretation by the court. Problems in cases involving scientific evidence usually arise from problems of interpretation rather than from experimental errors.<sup>708</sup> There is often a failure of communication between scientific witnesses and lawyers.<sup>709</sup> Witnesses cannot make conclusive statements, for example, whether a stain was left by a particular person, on the basis of a single item of scientific evidence. Expert witnesses should thus give evidence in a way that clearly expresses the value of the evidence and enables the court to combine scientific evidence relating to a particular issue with other evidence relating to the same issue. Such evidence should thus not be given in the form of probabilities or assertions, or the results of significance tests, because these cannot be combined with other evidence. According to Robertson and Vignaux<sup>710</sup> the best option is to receive the evidence in the form of a likelihood ratio, which can then be combined with other evidence by simple multiplication.<sup>711</sup>

Another factor that can influence the evidentiary value of scientific evidence is the procedural system itself. In the adversarial system the risk remains that the most effective advocate rather

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<sup>706</sup> Goodwin submits (at 172) that especially in terms of the evaluation of DNA evidence, there is a need for the education of lawyers, judges and assessors. The author also proposes that adequate resources should be made available to allow both parties to contest the value and reliability of the DNA evidence. In addition, she recognises a need for lawyers to be more skilled when cross-examining scientists who appear as expert witnesses, and suggests that guidance should be provided to tribunals dealing with scientific evidence through the occasional intervention of neutral, court-appointed experts or assessors.

<sup>707</sup> Op cit (1995) at 219

<sup>708</sup> See, for example, Hall (op cit) who states that sometimes apparent discrepancies in DNA evidence are the result of thinking that the expert is describing the likelihood of finding a duplicate anywhere in the world, when he is actually talking about the probability of coincidence between the two samples occurring in a random selection of people.

<sup>709</sup> Robertson and Vignaux (1995) at 219. These authors state (at 217) that logic, probability and inference provide the language in which the two groups should communicate with each other.

<sup>710</sup> Op cit (1995) at 220

<sup>711</sup> These authors submit (at 217) that all the rules said to govern expert evidence, such as the field of expertise rule and the ultimate issue rule, could be translated into a demand that courts accurately assess the probative value of the evidence as measured by the likelihood ratio.

than the truth will prevail.<sup>712</sup> McEwan<sup>713</sup> submits that in jury trials especially, scientific evidence could create problems. The jury is generally not presented with a scientifically organised collection of facts to each of which they can attach statistical links to various other facts and possibilities directing the proper verdict. Instead, an incoherent mass of data must be organised by the jurors themselves into a story they can understand and the cognitive techniques they employ are generally those they would use when reading a detective story or watching a thriller - identifying the central action and relating other evidence to it. In the non-jury trial system of South Africa, it would be in the interests of the proper functioning of the adversarial system that each contestant has the incentive and resources to challenge the prosecution's evidence.<sup>714</sup> There is thus a definite need for trial lawyers to become conversant with current developments in forensic science to ensure sufficient knowledge when calling and cross-examining scientists. In particular, the significance of statistical methods involved in presenting DNA evidence in court should be better understood. It should be borne in mind that DNA identification is based on complex and sophisticated techniques and employs very intricate statistical projections. Its validity is therefore very hard to assess. Yet, it presents seemingly 'hard' quantified data in fairly simple endpoint terms, generally offering odds that are the equivalent of a "numerical sledgehammer".<sup>715</sup>

Goodwin<sup>716</sup> submits that it would be of particular concern if courts were mistakenly to conclude that figures about the odds of a random match, could be uncritically transformed into a finding about guilt or innocence, based on the assumption that such large numbers almost automatically satisfy the requirement of proof beyond reasonable doubt. The author states further that it is in the interests of justice that a consistent, reliable method of analysis be adopted, especially with regard to DNA evidence. There is no doubt that there is a need for the establishment and enforcement of standards governing all aspects of forensic procedure, from sample collection and laboratory analysis to statistical projection. Standards for the use of DNA evidence in South Africa remain to be established, *inter alia* for the following: the

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<sup>712</sup> See McEwan at 7. In an adversarial trial an interested party that has discovered relevant facts may not want to reveal them to the court. Thus a key witness or relevant evidence might be omitted from an adversarial trial if both parties fear what the evidence might do to their case.

<sup>713</sup> At 12-13

<sup>714</sup> Goodwin at 170. This would be necessary for the proper functioning of section 35(3) of the final Constitution which in subsection (i) entrenches the right to challenge and adduce evidence.

<sup>715</sup> See MM Schultz 'Reasons for Doubt: Legal Issues in the Use of DNA Identification Techniques' in Billing PR (editor) *DNA on Trial: Genetic Identification and Criminal Justice* (1992) at 28

declaration of matches between VNTR profiles, the determination of the probability of random or coincidental matches and the generation of applicable databases.<sup>717</sup> As far as fingerprint evidence is concerned, there seems to be a definite need to increase the number of points of similarity required in order to establish a match. In addition, there is as a need to fully investigate the presence and effect of dissimilarities on the validity of a declaration of a fingerprint match in a particular case.<sup>718</sup>

The Criminal Procedure Act<sup>719</sup> deals with some issues surrounding the presentation of scientific evidence in courts in South Africa.<sup>720</sup> However, technological and scientific developments are taking place at an increasing rate and the law needs to find appropriate ways in which to deal with advancing science, without compromising justice. There presently seem to be two factors operating with regard to expert evidence in South African courts. Firstly, there is an increase in the number of scientific techniques being used for forensic purposes, with a concomitant increase in expert witnesses appearing before the court. Secondly, the emergence of a Constitutional dispensation in South Africa has, and will no doubt continue to have, an influence on the way courts deal with the issue of unlawfully obtained evidence.<sup>721</sup> These factors could provide the impetus for a reconsideration of how the criminal procedure deals with such evidence, for example, by investigating the possibility of new legislation, which will contain specific evidentiary and procedural rules dealing exclusively with novel scientific evidence in a Constitutional society.

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<sup>716</sup> At 172

<sup>717</sup> See Goodwin at 172

<sup>718</sup> See the discussion in paragraph 3.2.3 *supra*

<sup>719</sup> Act 51 of 1977

<sup>720</sup> The Act provides for rules of evidence and procedural rules regarding fingerprints and other identifying marks, the results of blood tests, as well as the presentation of various types of scientific evidence by means of affidavit (see *inter alia* the references to section 212 (in paragraphs 2.2) and 225 (in paragraph 2.5.4) *supra*).

<sup>721</sup> See generally paragraph 2.5 *supra*. Especially the right to privacy, guaranteed in section 14 of the final Constitution, could have far reaching effects for forensic techniques that require samples of body fluids or tissues to be taken from a suspect.

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